
California State University,
FRESNO
GENERAL
CATALOG
1990-91

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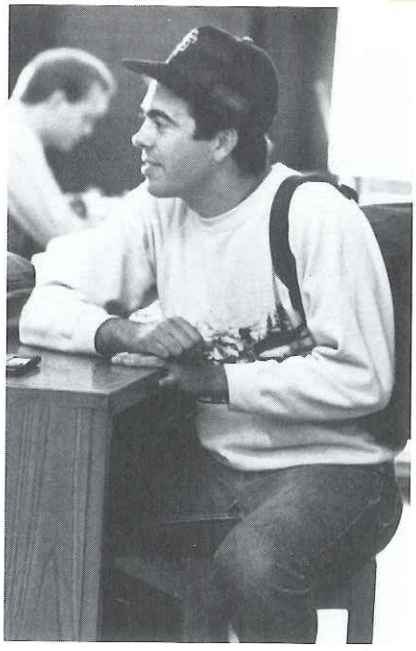

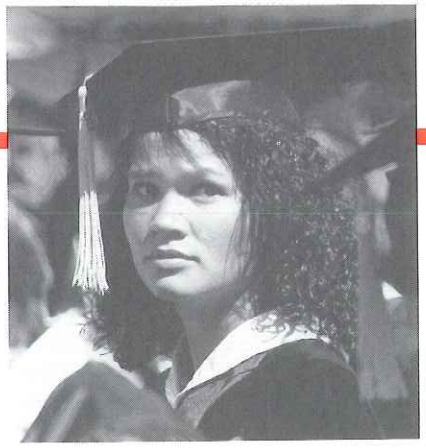

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Academic Calendar 1990–91

Please Note: This document is not intended to be construed as an employee work calendar.

APRIL 1990

16 Advising and Early Registration for the Fall 1990 semester begins

26–29 VINTAGE DAYS

MAY 1990

26 79th annual COMMENCEMENT

29 SUMMER SESSION (May 29–Aug. 17) begins; see *Summer Session Catalog*

JUNE 1990

1–July 6 DISCOVERY '90 — orientation sessions with academic advising for new undergraduates and their parents

29 Last day for faculty to submit CHANGES AND CLEARANCES (incomplete grades, approved petitions, departmental approvals, etc.) required for graduation with a baccalaureate degree at the end of the Spring 1990 semester

JULY 1990

6 Last day to pay fees for Early Registration for Fall 1990 semester

1990 FALL SEMESTER

AUGUST 1990

21 MINI-DISCOVERY '90 — orientation sessions for new undergraduates

22 SEMESTER BEGINS
ACADEMIC ASSEMBLY for faculty; priority ADD DAY for Early Registration

23 WALK-THROUGH REGISTRATION

24 Regular ADD/DROP period begins

27 INSTRUCTION begins; LATE REGISTRATION begins ($25 late fee); auditors may register
Application period (Aug. 27–Sept. 11) for degrees to be granted in December 1990

SEPTEMBER 1990

3 Labor Day — no classes; all offices closed

4–28 Filing period for applications for Spring 1991 student teaching — Multiple Subject (elementary) and Single Subject (secondary) Credential Programs

10 LATE REGISTRATION ends; end of REGULAR ADD PERIOD; last day to:
- register for Credit by Examination
- file for refunds by resident students; nonresidents see *Schedule of Courses,* "Fee Refund Schedule"

11 End of regular filing period for applications for degrees to be granted in December 1990

17 Last day to file an application for the MASTER'S DEGREE to be granted in December 1990 (late fee required Sept. 12–17)

18 Last day to file an application for the BACCALAUREATE DEGREE to be granted in December 1990 (late fee required Sept. 12–18)

24 Last day to DROP CLASSES without notation on the permanent record; last day to:
- obtain approval for credit/no credit grading
- change from audit registration to credit registration or credit registration to audit registration
- take examination for Credit by Examination

OCTOBER 1990

8 Last day for faculty to submit Credit by Examination grade

12 Last day for graduate students to apply for ADVANCEMENT TO CANDIDACY this semester to be eligible for graduation in May 1991

26 Last day to file edited, committee-approved MASTER'S THESIS for December 1990 graduation

NOVEMBER 1990

1 Filing period (Nov. 1–Feb. 1) for scholarships for the 1991–92 academic year begins

12 Advising and Early Registration for the Spring 1991 semester begins

14 ADVISING DAY — orientation with academic advising for new undergraduates and their parents, Spring 1991 semester

16 Last day to DROP CLASSES for SERIOUS AND COMPELLING REASONS, except by complete withdrawal from the university

22–23 THANKSGIVING RECESS

DECEMBER 1990

3 Last day to pay fees for Early Registration for the Spring 1991 semester

11 Last day of instruction; last day to withdraw from a complete program

12–18 SEMESTER EXAMINATIONS

21 FALL SEMESTER ENDS
Last day for incomplete grades to be made up from Fall 1989; last day to submit to the Graduate Office departmental clearance paperwork on behalf of December 1990 master's degree candidates (include a photocopy of the completed final report on incomplete or in-progress work, if needed for graduation)

1990

Classes in session

AUGUST						
S	M	T	W	T	F	S
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SEPTEMBER						
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30	31					

DECEMBER 1990

Dec. 24–Jan. 21 WINTER RECESS

JANUARY 1991

2–18 WINTER SESSION; see *Winter Session Catalog*

1991 SPRING SEMESTER

JANUARY 1991

21 Martin Luther King Jr. Day — campus closed
22 SEMESTER BEGINS
ADVISING DAY — orientation with academic advising for new undergraduates and their parents, Spring 1991 semester
23 Priority ADD DAY for Early Registration
24 WALK-THROUGH REGISTRATION
25 Regular ADD/DROP period begins; last day for faculty to submit CHANGES AND CLEARANCES (incomplete grades, approved petitions, departmental approvals, etc.) required for graduation with a baccalaureate degree at the end of the Fall 1990 semester
28 INSTRUCTION begins; LATE REGISTRATION begins ($25 late fee); auditors may register
Application period (Jan. 28–Feb. 11) for degrees to be granted in May 1991

FEBRUARY 1991

1 Last day to file applications for scholarships for the 1991–92 academic year
1–28 Filing period for applications for Fall 1991 student teaching — Multiple Subject (elementary) and Single Subject (secondary) Credential Programs
8 LATE REGISTRATION ends; end of REGULAR ADD PERIOD; last day to:
- register for Credit by Examination
- file for refunds by resident students; nonresidents see *Schedule of Courses,* "Fee Refund Schedule"

11 End of regular filing period for applications for degrees to be granted in May 1991
15 Last day to file an application for the MASTER'S DEGREE to be granted in May 1991 (late fee required Feb. 12–15)
18 Presidents' Day — no classes; all offices closed
19 Last day to file an application for the BACCALAUREATE DEGREE to be granted in May 1991 (late fee required Feb. 12–19)
25 Last day to DROP CLASSES without notation on the permanent record; last day to:
- obtain approval for credit/no credit grading
- change from audit registration to credit registration or credit registration to audit registration
- take examination for Credit by Examination

MARCH 1991

2 Filing deadline for Financial Aid for the 1991–92 academic year
11 Last day for faculty to submit Credit by Examination grade
15 Last day for graduate students to apply for ADVANCEMENT TO CANDIDACY this semester to be eligible for graduation in August 1991 or December 1991
25–29 SPRING RECESS

APRIL 1991

1 Last day to file edited, committee-approved MASTER'S THESIS for May 1991 graduation
15 Advising and Early Registration for the Fall 1991 semester begins
25–28 VINTAGE DAYS
26 Last day to DROP CLASSES for SERIOUS AND COMPELLING REASONS, except by complete withdrawal from the university

MAY 1991

17 Last day of instruction; last day to withdraw from a complete program
20–24 SEMESTER EXAMINATIONS
25 80th annual COMMENCEMENT
30 SPRING SEMESTER ENDS
Last day for incomplete grades to be made up from Spring 1990; last day to submit to the Graduate Office departmental clearance paperwork on behalf of May 1991 master's degree candidates (include a photocopy of the completed final report on incomplete or in-progress work, if needed for graduation)

JUNE 1991

3 SUMMER SESSION (June 3–Aug. 23) begins; see *Summer Session Catalog*
28 Last day for faculty to submit CHANGES AND CLEARANCES (incomplete grades, approved petitions, departmental approvals, etc.) required for graduation with a baccalaureate degree at the end of the Spring 1991 semester

1991

Classes in session

JANUARY

S	M	T	W	T	F	S
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FEBRUARY

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MARCH

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24	25	26	27	28	29	30
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APRIL

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14	15	16	17	18	19	20
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MAY

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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

The California State University

The individual California State Colleges were brought together as a system by the Donahoe Higher Education Act of 1960. In 1972 the system became The California State University and Colleges and in 1982 the system became The California State University. Today, all 20 campuses have the title "university."

The oldest campus — San Jose State University — was founded as a Normal School in 1857 and became the first institution of public higher education in California. The newest campus — California State University, San Marcos — will begin admitting students in fall 1990.

Responsibility for The California State University is vested in the board of trustees, whose members are appointed by the governor. The trustees appoint the chancellor, who is the chief executive officer of the system, and the presidents, who are the chief executive officers on the respective campuses.

The trustees, the chancellor and the presidents develop systemwide policy, with actual implementation at the campus level taking place through broadly based consultative procedures. The Academic Senate of The California State University, made up of elected representatives of the faculty from each campus, recommends academic policy to the board of trustees through the chancellor.

Academic excellence has been achieved by The California State University through a distinguished faculty, whose primary responsibility is superior teaching. While each campus in the system has its own unique geographic and curricular character, all campuses, as multipurpose institutions, offer undergraduate and graduate instruction for professional and occupational goals as well as broad liberal education. All of the campuses require for graduation a basic program of *General Education Breadth Requirements* regardless of the type of bachelor's degree or major field selected by the student.

The CSU offers more than 1,500 bachelor's and master's degree programs in some 200 subject areas. Many of these programs are offered so that students can complete all upper-division and graduate requirements by part-time late afternoon and evening study. In addition, a variety of teaching and school service credential programs are available. A limited number of doctoral degrees are offered jointly with the University of California and with private institutions in California.

System enrollments total more than 360,000 students, who are taught by some 20,500 faculty. Last year the system awarded more than 50 percent of the bachelor's degrees and 30 percent of the master's degrees granted in California. More than 1.2 million persons have been graduated from the 19 campuses since 1960.

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Dr. David W. Benson, President
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Dr. John W. Moore, President
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Long Beach, CA 90802-4275
(213) 590-5506

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Ex Officio Trustees

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Governor of California
State Capitol, Sacramento 95814

The Honorable Leo T. McCarthy
Lieutenant Governor of California
State Capitol, Sacramento 95814

The Honorable Willie L. Brown Jr.
Speaker of the Assembly
State Capitol, Sacramento 95814

The Honorable Bill Honig
State Superintendent of Public Instruction
721 Capitol Mall, Sacramento 95814

Dr. W. Ann Reynolds
Chancellor of
The California State University
400 Golden Shore
Long Beach 90802-4275

Officers of the Trustees

Governor George Deukmejian
President

Marianthi Lansdale
Chair

William D. Campbell
Vice Chair

W. Ann Reynolds
Secretary-Treasurer

Appointed Trustees

Appointments are for a term of eight years, except for a student trustee, alumni trustee and faculty trustee whose terms are for two years. Terms expire in the year in parentheses. Names are listed in order of appointment to the board.

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Willie J. Stennis	(1991)
Dean S. Lesher	(1993)
Roland E. Arnall	(1990)
Dixon R. Harwin	(1990)
Lee A. Grissom	(1990)
Marian Bagdasarian	(1996)
Marianthi Lansdale	(1993)
John E. Kashiwabara, M.D.	(1994)
Martha C. Fallgatter	(1995)
William D. Campbell	(1995)
Lyman H. Heine, Ph.D.	(1991)
Ralph R. Pesqueira	(1996)
Ted J. Saenger	(1997)
J. Gary Shansby	(1992)
Scott Vick	(1991)
Anthony M. Vitti	(1997)
Gloria S. Hom	(1992)

Correspondence with Trustees should be sent:

c/o Trustees Secretariat
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Long Beach, CA 90802-4275

Office of the Chancellor

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W. Ann Reynolds
Chancellor

Herbert L. Carter
Executive Vice Chancellor

Lee R. Kerschner
Vice Chancellor, Academic Affairs

D. Dale Hanner
Vice Chancellor, Business Affairs

Caesar J. Naples
Vice Chancellor,
Faculty and Staff Relations

Mayer Chapman
Vice Chancellor and
General Counsel

John M. Smart
Vice Chancellor, University Affairs

In this final decade of the 20th century, we live in a dynamic world — filled with change and challenge, with the heightened color of many cultures sharing one small planet. On the campus of California State University, Fresno, too, there are the challenges and the changes that come with a new and exciting diversity in our student body.

Ten short years ago, a cross section of CSUF students would have been characterized by its homogeneity. Today a cross section reflects amazing variety.

Where *are* we as a campus in the 1990s? What happened to us in the '80s?

In short, we grew, we reached out to a broader community, and we brought to this campus a new kind of student. As we look over this sea of new faces, we see students of all ages, more people of color, many students from lands across the seas, and more learners who have grown up speaking languages and dialects other than the one traditionally spoken by our faculty and alumni.

Culturally, we have changed. Through our doors today come increasing numbers of Hispanic, African-American, Hmong, Laotian and Cambodian students who make the San Joaquin Valley their home — as well as those who call other continents their home. This diversity is the fruit of the labors of dedicated forebears, of public leaders of conscience, and of educators of vision. And this diversity is the promise of our future.



Enjoying the parklike setting of the CSUF campus, President Harold Haak chats with Rosa Rodriguez and Martin Rodriguez (no relation) between classes.

Join us this year at CSU, Fresno in celebrating the richness and the reward of diversity!

Sincerely,

Harold H. Haak
President
California State University, Fresno



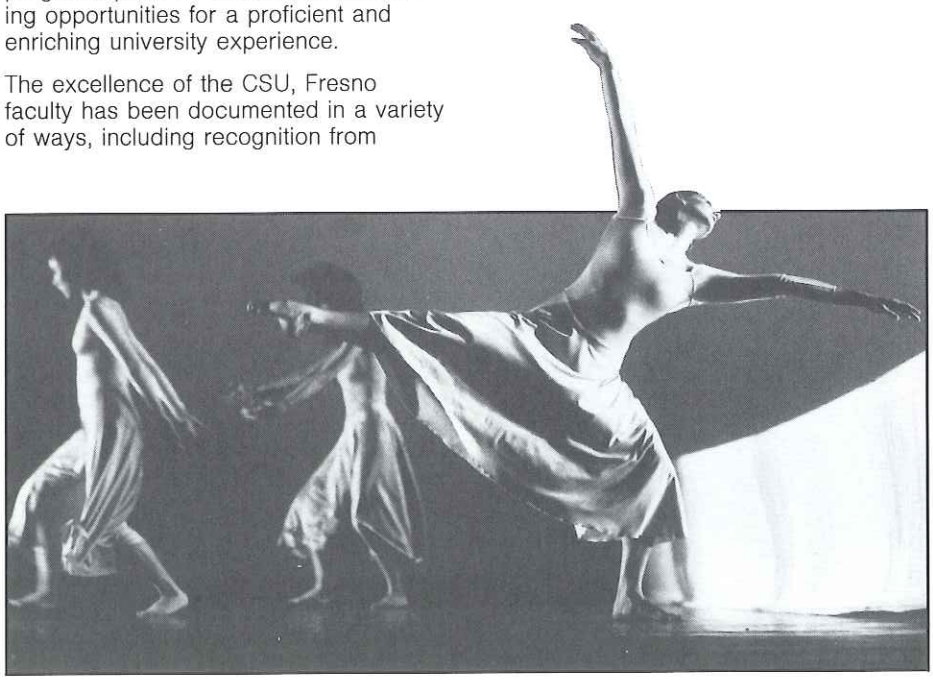
PREVIEW



California State University, Fresno is a stimulating center of intellectual and cultural activity, dedicated to academic excellence, integrity and freedom. It is committed to developing qualified professionals and leaders, and to serving the San Joaquin Valley.

CSU, Fresno offers challenging and innovative programs in the liberal arts and sciences, in the professions, in applied fields, and in special and interdisciplinary areas. Departmental programs provide unusual and interesting opportunities for a proficient and enriching university experience.

The excellence of the CSU, Fresno faculty has been documented in a variety of ways, including recognition from national and international associations. Eighty-seven percent of the tenured faculty hold doctoral degrees in their areas of study. However, the most important characteristic of the CSU, Fresno faculty is their ability to care about students and their willingness to give of their time on an individual basis.



The Campus

Under a dense canopy of more than 4,000 trees, the CSU, Fresno campus sits at the northeast edge of Fresno, amid San Joaquin Valley vineyards and orchards, and against a backdrop of the beautiful Sierra Nevada. The campus was officially designated as an arboretum in 1978 and its parklike setting creates a beautiful environment for making new friends and pursuing a quality education.

The 327-acre main campus features more than 46 traditional and modern buildings. An additional 34 structures are on the 1,083-acre University Farm, which is considered one of the most modern and best equipped agricultural facilities in the West.

Outstanding research facilities, including computer, engineering, electronics, and industrial technology laboratories, are complemented by cultural and recreational facilities — two student unions, indoor and outdoor theaters for drama and music, swimming facilities, many individual and team sport facilities, a baseball stadium at Beiden Field that seats 4,575 spectators, and a 30,000-seat football/soccer stadium.

The CSU, Fresno campus is fully accessible and students with mobility impairments will find the naturally flat terrain easy to navigate.



The Community

Fresno's metropolitan area has a population of more than 600,000 and yet it maintains a friendly "big town" feeling. Cultural events are numerous and feature such groups and facilities as the Fresno Philharmonic Orchestra, the Fresno Arts Center, the Fresno Metropolitan Museum and several live theater organizations.

The community is proud of CSU, Fresno and enthusiastically supports many of the university's programs, whether they are sports, the arts, academic competitions or other special events.



Recreation

Fresno is the only place in the nation within an easy drive of three national parks — Yosemite, Sequoia and Kings Canyon. Therefore, it isn't surprising that much of CSU, Fresno's recreational and social life centers on the outdoors.

Boating, fishing, water skiing and windsurfing at one of the six nearby lakes are popular activities during the spring and summer. Winter recreation includes downhill skiing and cross-country skiing at nearby Sierra Summit or Badger Pass in the beautiful Sierra Mountains.

In addition to an extensive intramural program, on-campus recreation includes a series of current films, drama productions and concerts ranging from rock to jazz to classical. The annual Vintage Days celebration and a number of university receptions, winetastings, art festivals and the University Lecture Series are among the many events open to the public. Informal meeting places such as the University Student Union and the Satellite Student Union are visited by students throughout the day and evening.



President Jimmy Carter
The 39th President of the United States, Jimmy Carter, receives a warm CSUF welcome. President Carter's most significant achievements were the signing of the Camp David Accords and his concern for human rights around the world.

University Lecture Series

The University Lecture Series is an educational forum featuring distinguished speakers, performers and public figures. The Series seeks to make available unique opportunities which benefit both the campus and the community. The programs are open to all who wish to attend.

Featured speakers and performers have included President Gerald Ford, educator Terrel Bell, journalist Ellen Goodman, artist Judy Chicago, dancer Mikhail Baryshnikov, lawyer Elliot Richardson, Israeli U.N. Ambassador Abba Eban, activist Maki Mandela, historian Martin Marty, politician Geraldine Ferraro, Senator Edmund Muskie, singers Sweet Honey in the Rock, playwright Luis Valdez, and Marian Wright Edelman, an advocate of disadvantaged children.

The Series is funded in part by the Office of the Vice President for Academic Affairs, the University Student Union Board and the Associated Students Inc. In addition, special programs may be planned, supported, or jointly sponsored by off-campus groups or organizations.



Gwendolyn Brooks
Gwendolyn Brooks is a Pulitzer Prize-winning poet and Poet Laureate from Illinois. In 1985, she was named Consultant-in-Poetry to the Library of Congress.



Rt. Hon. Edward Heath
The Rt. Hon. Edward Heath was Prime Minister of Great Britain from 1970–74 and leader of the Conservative Party from 1965–75. Honored worldwide, he is a respected international statesman.



Isabel Allende
A celebrated novelist, Isabel Allende is most known for her internationally acclaimed best-selling novel, *The House of the Spirits*. Born in Santiago, Chile, and the niece of the late President Salvador Allende, her novels keep alive the memory of her family and country.

Accreditation

California State University, Fresno is fully accredited by the California Board of Education and the Western Association of Schools and Colleges.

CSU, Fresno is also a member of the Western Association of Graduate Schools, the Council of Graduate Schools in the United States, and the American Association of Colleges for Teacher Education.

School, department, or program accreditations, certificated memberships, and accrediting organizations include:

- American Assembly of Collegiate Schools of Business
- National Council for Accreditation of Teacher Education
- Commission on Teacher Credentialing
- Council on Education of the Deaf
- American Speech-Language-Hearing Association
- American Chemical Society
- Accreditation Board for Engineering and Technology
- State Board of Registration for Professional Engineers and Land Surveyors
- National Accreditation Council for Environmental Health Curricula
- State Department of Public Health
- American Dietetic Association
- American Home Economics Association
- National Association of Industrial Technology
- Foundation for Interior Design Education Research
- Accrediting Council on Education in Journalism and Mass Communications
- National Association of Schools of Music
- National Association of Schools of Theatre
- California Board of Registered Nursing
- National League for Nursing
- American Physical Therapy Association
- Council on Rehabilitation Education, Inc.
- Council on Social Work Education
- National Athletic Trainers Association
- National Recreation and Park Association

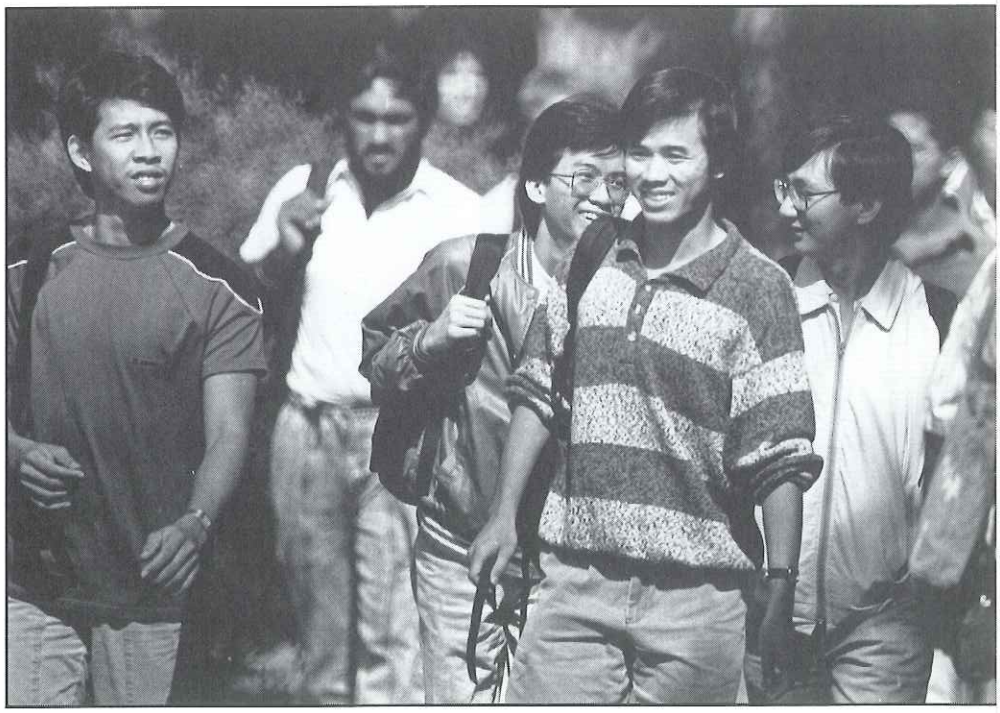
The University's Mission

The primary mission of California State University, Fresno is to provide comprehensive bachelor's and master's degree instruction for qualified students. The university may in the future offer doctoral degrees jointly with a doctoral granting university in some academic areas. As the major public university in the San Joaquin Valley, a large geographical area with a rapidly growing population, the university especially serves students from its particular service area: Fresno, Madera, Kings and northern Tulare counties.

The university provides a General Education Program for the purpose of fostering life-long learning and works in partnership with community colleges for the matriculation of transfer students. The university maintains strong programs in the arts and sciences as well as in many professional and applied fields. The university also emphasizes programs in agriculture and business, reflecting its location in the world's premier agriculture and agribusiness center. The university recognizes a special commitment to work with the community in the preparation of students for industries and professions in the San Joaquin Valley.

As a publicly supported institution, the university also has a special mission to serve students from groups that historically have not participated in university education, whether because of age, socioeconomic background, physical disability or geographical location.

The university fosters applied research and public service programs that encourage the development of its faculty and support and enhance instruction, especially those contributing to the intellectual, social, cultural and economic vitality of the San Joaquin Valley and California.



The University's History

CSU, Fresno is the sixth oldest in The California State University system. It began with the establishment of the first junior college in California in 1910 and a state normal school in 1911 which, under a single administration, offered two-year programs in general and vocational training and in teacher preparation.

Between 1911 and 1921 a campus was built on University Avenue, then the northern border of Fresno. In 1921 the combined schools became Fresno State Teachers College, authorized to offer a four-year program and grant the bachelor of arts degree in teaching.

In 1935, by act of the Legislature, the official designation became Fresno State College. A variety of degree programs in addition to those related to the teaching credential were authorized at that time. Following World War II, expansion was accelerated, both academically and physically. The first master's degree was offered in 1949; today it is offered in 42 fields of study.

Between 1953 and 1958 the college was moved from the old campus site, by then surrounded by the City of Fresno, to a 1,410-acre site six miles to the northeast. In 1961, under the newly created California State College system, the administration and control of the state colleges was transferred from the State Board of Education to an independent board, the Trustees of the California State Colleges. By legislative action in 1972 the state college system became The California State University and Colleges, and in 1982 the system was renamed The California State University.

The present official seal of the university was designed by artist and CSU, Fresno Professor Emeritus Darwin Musselman, who also created the new seal used by The California State University system. It includes the "lamp of learning" and the "book of knowledge." The Latin inscription "Lvcem Accipe Vt Reddas" translates to "Receive the light that you may give it forth." The date 1911 refers to the founding year of the school.

Between 1965 and 1968 an approximation of university organization was accomplished on the Fresno campus and the transition to official university status in the state system became effective on June 1, 1972. The university now comprises the Schools of Agricultural Sciences and Technology, Arts and Humanities, Business and Administrative Sciences, Education and Human Development, Engineering, Health and Social Work, Natural Sciences, Social Sciences, the Division of Extended Education, and the Division of Graduate Studies and Research.

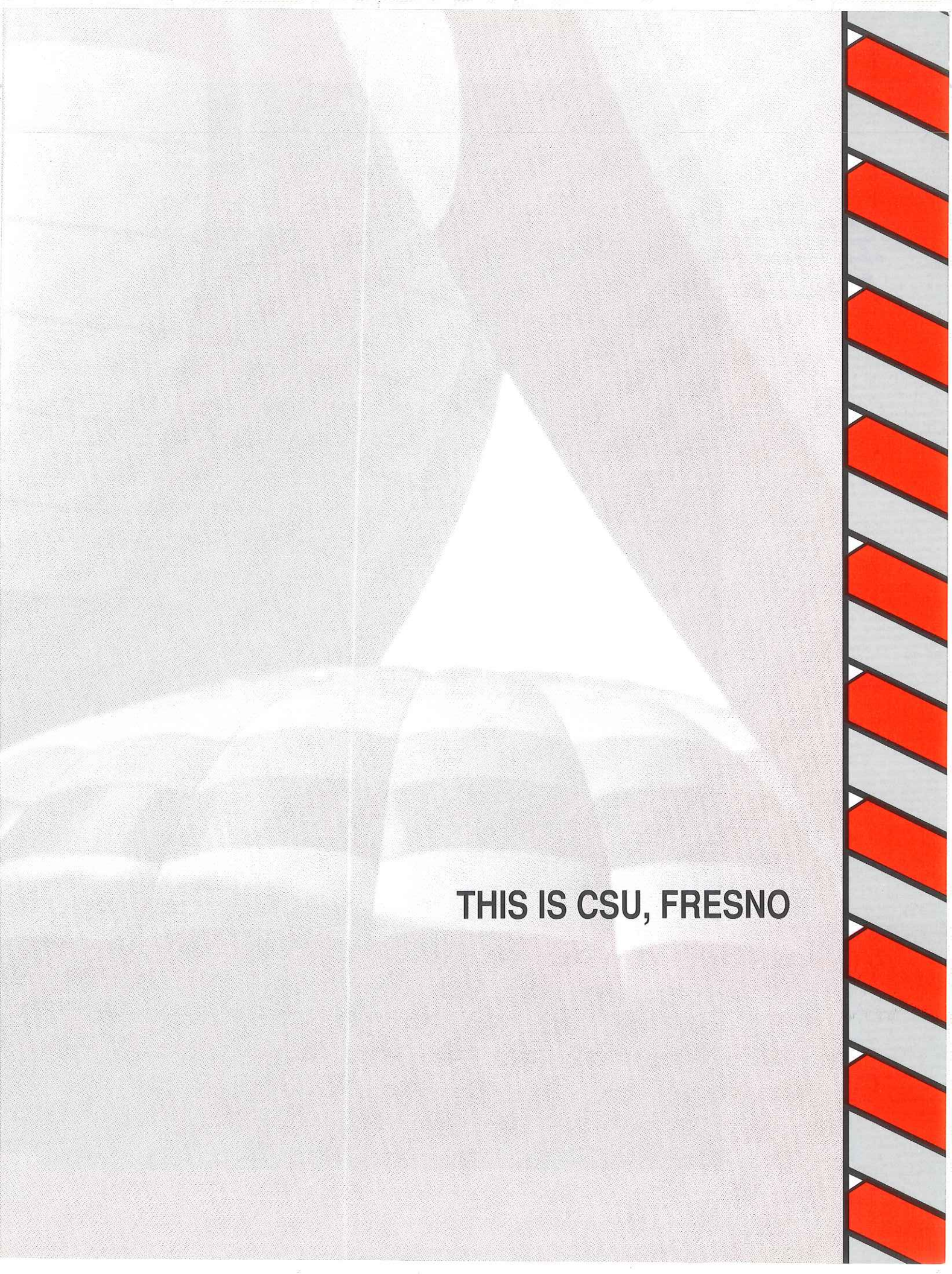


Fresno State College in 1911 had an enrollment of 150 students, most of whom were women. By 1940 the enrollment had increased to 2,000 students, by 1964, to 7,500. In the fall of 1989 more than 19,500 students registered.

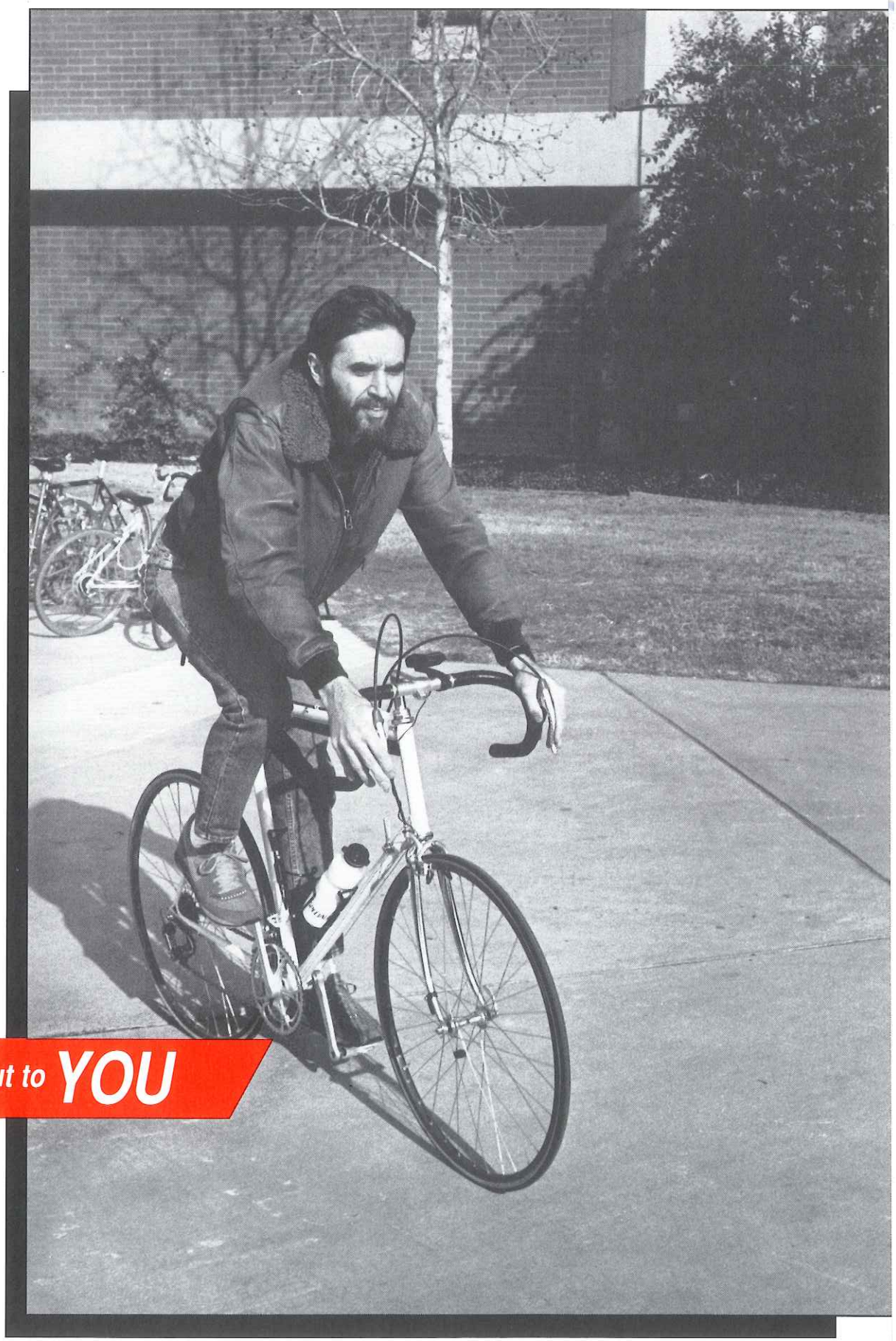
The presidents, in order of tenure are:

Charles L. McLane	(1911–1927)
Frank W. Thomas	(1927–1948)
Arnold E. Joyal	(1948–1964)
Frederic W. Ness	(1964–1969)
Karl L. Falk (Acting)	(1969–1970)
Norman A. Baxter	(1970–1980)
Harold H. Haak	(1980–)




THIS IS CSU, FRESNO

A quiet activist, Fred Schreiber encourages personal recycling and riding a bicycle instead of driving a car, as long as the weather permits.



. . . Reaching out to YOU

This is a whole lot of fun for me as a teacher . . . to help students plan for their future or to be able to connect with them on the level of amazement, of being able to say 'WOW' together.

Fred E. Schreiber
Professor, Biology



You, the students, are the heart and soul of California State University, Fresno. Along with your diverse bloodlines, you bring life to this campus with your endless inquiries and expressions of amazement. When you graduate, it is our hope that because of the people you have met here, your heart will be a bit bigger and your soul will be true to you.

And, if by chance you meet Fred Schreiber along the way, don't say we didn't warn you. He will challenge you, admittedly sometimes to the point of frustration. But he'll also get you to think for yourself — about the complexity of issues — and he won't give you a simple, one-sided view. It's just not his style.

"If someone proposes a simple, one-sided view of any issue, I automatically become suspicious," the biology professor says. *"It's a bias of mine. I have a hard time believing that any issue in the world is that simple. I don't care whether we're talking about pest control or chemical carcinogens, population or Third World hunger. They're all complex problems. And I think we should expect them to be complex. That's what I enjoy about teaching — analyzing the facets of an issue and getting students to do the same."*

If you're thirtysomething, you instinctively know that this guy is a Child of the Sixties. Sure, there are the telltale signs — his Martin Luther King poster and his view of education as a great way of unifying society across some of the traditional divisions of race and ethnic backgrounds. But when he hits you with this Sixties adage — *"If you aren't part of the solution, then you're the problem"* — you know it's time to trust your instincts.

"I teach a human ecology course from the perspective of how problems can be solved," he says. *"How environmental degradation can be reversed, rather than simply presenting 'The sky is falling, woe is me' approach, where students end up feeling that things are so bad that there's nothing they can do.*

"I try to make them rational activists so they understand the nature and causes of environmental problems from a scientific standpoint ... rational, so they have some perspective on how to attack the problems and can participate in the solutions."

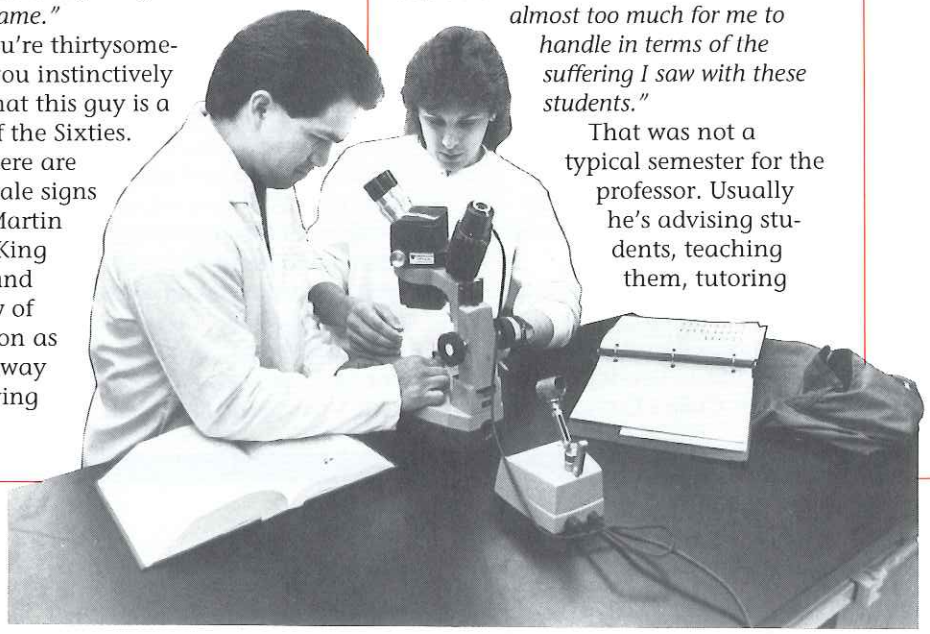
Fred Schreiber doesn't have to say he cares about his students. It's obvious when he talks about that one semester when three students either withdrew or took an incomplete due to a mother's death, a child molestation and a murder.

"When you teach a large number of students, it isn't surprising that you also run into some of the misery that life sometimes throws at us," he muses. *"But that semester I was overwhelmed. It was almost too much for me to handle in terms of the suffering I saw with these students."*

That was not a typical semester for the professor. Usually he's advising students, teaching them, tutoring them, or providing guidance for career planning. *"This is a whole lot of fun for me as a teacher ... to help students plan for their future or to be able to connect with them on the level of amazement, of being able to say 'WOW' together."*

Fred Schreiber considers students who are unmotivated and uninterested a challenge. Despite the fact that they may be a frustrating and irritating challenge, he strongly feels that the responsibility for showing these students new possibilities rests with the faculty members.

"Once we show them the new possibilities, it's the students' responsibility to choose whether or not they are going to explore them," he says. *"And some students don't. They refuse. That's fine as far as I'm concerned. That's their choice, and I refuse to be discouraged by it. Rather, I take my encouragement from the students who do choose to explore the new possibilities, and there are always students who choose to explore."*



Freddie Cardenas (left) and Curtis Sisk collaborate on an entomology project.



Manuel Figueroa's students in Chicano and Latin American Studies learn how important social and cultural issues can affect them. Occasionally, these classroom discussions turn into lighthearted moments like this one.

. . . Reaching out to our HERITAGE

Cross the bridge from the second floor of McKee Fisk to reach the Social Science Building and, for a minute, you are *literally* traveling from one culture to another. For down the hall is an outpost for a rich and colorful field of inquiry in the social sciences known as the Chicano and Latin American Studies Program.

To consider this area of study as an isolated part at the end of this bridge is inappropriate. Because in essence, the Chicano and Latin American Studies Program *is* the bridge itself. It's an academic and resource center dedicated to fostering stronger ties with our Chicano and Latin American neighbors — linking the present with the past and the future, and our own little world with the community around it.

In this field you can find Manuel Figueroa. A native of Chile and a professor in this program since 1981, Figueroa counts as his primary concern the bridging of cultural differences and enrichment of cultural interests in and outside the university.

"Our program," he explains, *"has a very strong tie with the community. We become involved not only as teachers but as source persons for the different social and economic groups in the community."*

Involvement and commitment guide most of Manuel Figueroa's activities. Before joining CSUF, he was responsible for curriculum planning and liaison development as dean of education at Chile's Catholic University. As a graduate student at Stanford, he participated in research projects that benefited communities in Guatemala and Mexico. His published works, coupled with a distinguished career in academia and government service in Mexico, speak of educational development in cultural and social contexts.

Here, in the Chicano and Latin American Studies Program, Figueroa has chosen to cross yet another bridge — one that enables him to become as productive in research and teaching as before but, this time, with more emphasis on developing stronger ties with the Chicano and Latin American communities of Fresno.

"The commitment to quality education, in all aspects, is our most important concern," he states. *"And I think we work hard at that, as demonstrated in our program's increasing enrollment. But we need to work more. We need to reach those students who, in the past, were not reached at all, to provide meaningful education for everyone."*

But Manuel Figueroa won't be satisfied with mere increases in enrollment figures. For him, being a part of the Chicano and Latin American bridge has meant constant participation and dedication. As a strong advocate of involvement and growth, he handles each school term with vigor and renewed spirits. *"I see myself in a very continuous process of growth,"* he opines. *"Always moving to higher goals, I need to generate new ideas and new projects. That keeps me alive — intellectually and emotionally alive."*

In a campus that is continuously shaped by a kaleidoscope of cultures, we need to explore our past — and discover what binds us culturally and socially — so we can appreciate today.

Anonymous



How can one be truly vigorous in linking together the many facets of teaching and research with community involvement? Well, consider the energetic pace of Paulette Fleming's career as associate professor in the Art Department. It's a teaching career devoted mostly to outreach activities and, not surprisingly, to children.

"Kids are a very important part of my life," she offers. *"See, I used to work with Brownies. I started a Girl Scout troop, and at one time, I handled two troops. All that and graduate school. Can you imagine that?"*

Quite a feat, one might say. But think of the diverse interests Fleming pursued later on: a string of art exhibitions and designs for theatre productions in Massachusetts, North Carolina, and Ohio; extensive research on art education and environmental aesthetics; and the list goes on.

At CSUF, Fleming brings to the fore her expertise in the dynamic and holistic elements of art education. In one class (*see photo*), her main concern has been teaching teachers different ways to develop children's perceptions of art and the *"world of art"* around them. In other classes and in the projects she spearheads, the development of artistic expression and the many cultural manifestations found in art forms take center stage. All this, captured in a teaching technique nurtured by a richly diversified background.

Listen to her explain: *"I've been exposed to a variety of remarkable influences. I've traveled to other countries and have learned so much about my African-American heritage. Fortunately, I've also had extensive training and experience in different art fields."*

At present, Fleming is also deeply involved in research — focusing on a project that examines, in a fresh and different light, her African-American heritage. Her preliminary inquiries into the huge plantations of Crewell, North Carolina, reveal profoundly how African culture retained much of its original form when it was brought over to the United States.

Eventually, she hopes to provide explanations on the significance of this region and the role of the plantation workers in the country's development. *"In a way,"* she optimistically states, *"this would help connect African-Americans to Africa and to their African heritage."*

The overall picture of Paulette Fleming's work is a reflection of a multi-facted career. As a literal example, one self-portrait was done in mixed media — doing what artists would call an assemblage of photographs, mementos, artifacts, and other personal symbols that are related to the subject. *"I never throw anything away,"* she says. *"Artists like me, and like many other African-American artists in particular, tend to put together things that represent themselves, their past, and their culture in their work."*

And if Fleming were to do a work of art that would truly represent her present and future concerns in art education, it might be a mural of multi-colored pieces. Because in addition to her continuing work with educators and children, she devotes much of her time working with the community — a gesture that has inspired others to get work done in and outside the classroom.

"We need to bring community people to the campus to share art experiences with them," Fleming proposes. *"But we also need to bring our students out of the campus environment and into the public school systems so they can practice what they learn and, at the same time, explore the community's cultural traditions."*

Toward this end, Fleming, along with other faculty and administrators, worked on a project called Partners-in-Art. This project exposed participants to the art of the ethnic and cultural communities of Fresno. In the real sense of the word, it's been a partnership of sorts: the students with the teachers, the university with the community, and the cultures that link us all together.





Logistics professor Skip Sherwood took a calculated risk when he climbed aboard this Sante Fe engine. He and his colleagues are desperately trying to convince people that there's more to logistics than trains and trucks. In the classroom, the emphasis is on how logistics and the physical distribution of goods contribute to customer service and corporate profitability.

. . . Reaching out to our STUDENTS

Skip Sherwood's teaching style can be described in one word — *"imaginative."* In front of a classroom of 30 students, he is never still. Pacing back and forth, his voice carries so well that even Rip van Winkle would wake up and ask, *"What's going on?"*

That's all this professor needs. This grown-up kid is on a roll and has your interest, so he pulls out the Pringles and your favorite beverage and says, *"Hey, let's talk about logistics."*

"Education should be fun and there should be some levity in the classroom," Sherwood affirms. *"I usually try to use products that the students can somewhat relate to. We analyze distribution system requirements for potato chips, 10-speed bicycles, personal computers and our Valley's agricultural products.*

"My primary goal is to get students excited about a subject and make them glad that they are taking this course. If they are comfortable with that, the tendency is for them to want to come to class, try to learn something, and retain some of that knowledge."

Another thing this professor does is *"integrate."* He says students have a tendency to put *"blinders"* on when they walk into an individual classroom. They say, *"OK, I just came out of finance, so I don't have to remember anything from that class because this is logistics."*

Sherwood responds to this attitude by showing his students how logistics interfaces with finance ... or marketing ... or how accounting data is used in logistics. *"I try to make them realize that we're dealing with an integrated enterprise. I get concerned when students say they don't need a course because it's not a part of their major but they're taking it because they 'have to.' They don't realize how important it is to understand how business disciplines are related. So, I spend a great deal of time integrating these things."*

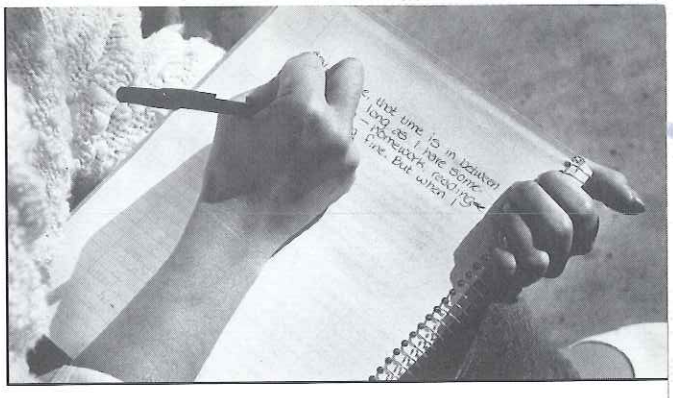
But students aren't the only people Sherwood is educating. In fact, he feels it's his mission to educate the rest of the world — or a good piece of the world — in terms of what logistics is.

"Everyone always asks me what is logistics," he says slyly, prepared to give his stock answer. *"A good piece of logistics, of course, is transportation. Consequently, my friends send me things like toy trucks. But the way my colleagues and I look at it is that marketing stimulates demand, and logistics and production service it. In marketing, you 'sell, sell, sell,' but if the product isn't available or doesn't get there, nobody is going to 'buy, buy, buy.' It's like every time the grocery store is out of a product, that's a breakdown in their logistics system."*

If you get the impression that Sherwood is pushing the logistics and operations management degree program, you're right. CSU, Fresno is one of three universities on the West Coast offering this program. You'll find schools offering a degree in production; they may even have one in purchasing. But very few schools have advanced to the point where they are putting it altogether the way CSUF is — the way it should be.

CSUF offers a program that deals with everything in the value-added chain — the management of supply systems which move raw materials and component parts to the point of production, the design and management of production operations, and the management of transportation and distribution of finished goods to the consumer.

"Right now, our students are our best ambassadors in terms of trying to educate the world," says Sherwood, noting that many graduates have landed some very impressive positions. *"The students graduating from this program are doing very well. It's a tough major, but when they come out of it, they've really got something to contribute."*



The vehicles for this decade will be partnerships, joint research agendas, and interdisciplinary programs, as we work toward improving the quality of education for all the children of all the people.

Barbara G. Burch, Dean
School of Education and Human Development

Unpretentiously, she brushes it off as a *"strange combination."* But one look at the diversity in Barbara Burch's resume will tell you that the new dean of the School of Education and Human Development has a great deal to contribute — not only to CSU, Fresno but to our larger educational community as well.

This industrious educator — with her numerous and varied degrees, coupled with *"real world"* experience — received her appointment as dean in August 1989.



Dean Barbara Burch sees a bright future for the School of Education and Human Development. Blueprints for a new education building map out a comprehensive learning development center with model classrooms, a graduate studies center, and clinics for reading, counseling, and special education.

Now, looking to the future, she begins: *"The School of Education and Human Development is a doorway between the university and the school community. To prepare educators for the 'real world' and to make a positive difference in the quality of schooling, we must be heavily involved with our colleagues in the world of practice. I see us working even more closely in partnerships with schools in the planning and delivery of our programs as well as in joint research initiatives."*

As for tomorrow's teachers, Burch explains, *"Education majors complete two student teaching experiences, and one of them must be in a school with high levels of student diversity and 'at risk' learners. We expect our students to be prepared with the knowledge, skills, and values to work effectively with students of diverse backgrounds.*

"This is a very unique university and community. Nowhere in the country can you find the opportunities that we have in Fresno; this city is a microcosm of diversity in every sense of the word and represents a precursor of where we are going nationally. We have an opportunity here to become an educational model for dealing with diversity in ways that ensure that every individual learns and develops to maximum potential."

Burch also shares her concern about the high school student dropout rate, which is approximately 30 percent locally and nationally.

"The people who do not make it through the system can't even begin to think about attending a university," she says emphatically. *"And, the quality of students who come to this campus will impact the future quality of every academic department here. Your business leaders, scientists, artists, teachers ... everyone in this university has a major stake in what happens in K through 12 schools."*

During her tenure at Memphis State University, Burch was a principal writer and project director for grants totaling more than $1.7 million. She also received a Professional Writing Award from the Association of Teacher Education for an article that explored new directions for schools of education.

"You see, our role in preparing teachers for grades K through 12 is widely recognized," Burch says, *"but I believe that a school of education also has an obligation to be responsive in training educators who work in non-school settings. People in hospitals, community agencies, and the world of work also need to know how to facilitate learning and how to best educate their employees and clients.*

"While the K through 12 schools are our principal mission and focus, I feel that education is too important and too critical an enterprise to assume that one can address it only in grades K through 12. It is a birth to aged consideration — a lifetime need. Our school expects to respond to that need."



Anne Rodiek is a natural with horses. Here, on the University Farm, she pampers a baby colt. At home, she's attentive to the needs of her five American Saddlebred horses.

. . . Reaching out to our FUTURE

When it comes to exploring the *endless* possibilities here on campus, check out the action with the baby colts and yearlings on the 1,083-acre University Farm. Walking past the stalls near the Judging Pavilion, you'll see horses frolicking and mares tending their young. This carefree atmosphere prevails at the rodeo arena, where students and professors ride their horses in an open field against a backdrop of the beautiful Sierra Nevada.

In sharp contrast, a Chicago suburb was where animal sciences professor Anne Rodiek became enamored of these high-spirited, long-maned animals. As a teenager, she frequented the local stables and then followed her heart by pursuing three degrees in animal science.

"One of my college professors was very influential," Rodiek explains. *"He encouraged me by telling me that there were career opportunities with horses and that I should do the things I like instead of the things I'm supposed to do."*

Today, Rodiek enlightens undergraduate students in the art and science of horse production and works with graduate students on research projects in horse nutrition and exercise physiology.

"We're continuing our research on how nutrition affects athletic performance," she says. *"In one study, we fed horses different amounts and different types of feed. Then, we took blood samples from them every 15 minutes for five hours, so we could study the changes in their blood glucose. Glucose is an energy source used to fuel muscle contraction for work or athletics. By monitoring blood glucose, we can get an idea of how much glucose is put into the blood from various feeds and how much is taken from the blood by the working muscles.*

"We got started with this work because people who have racehorses or show horses have all kinds of pet theories about what one should give horses right before they go to the track or into the ring to help make them win. We're trying to see what different feeds can do and will continue with this research to see what kinds of feeds we should give horses for different kinds of exercise."

Every fall, Rodiek teaches an introductory course on horse production where students receive hands-on, practical experience with baby colts. Then in the spring, these same students enroll in an advanced horse management course that stresses the basics of nutrition, breeding systems and exercise physiology.

"Like right now," says the professor, referring to her fall semester class, *"these students started with baby colts that were not weaned from their mothers. These babies were untouched by human hands and were totally wild. The students caught them and haltered them.*

"I don't know who got bruised and banged up more — the students or the horses. But now the horses have been weaned, and the students lead the horses around and they'll stand tied. They're little gentlemen instead of wild monsters, so the students are going to show these baby colts at the Little Grand National as a chance to show off what they've done."

While Anne Rodiek is a strong advocate of giving her students that "hands-on" experience, she can't help but be concerned about what takes place in her labs.

"I'll go out there and say, 'Here are the halters; there are the colts. Go for it.' And then I watch them and think, 'Well, maybe I ought to be teaching them this or that.' But I believe they learn more from figuring it out themselves than if I protected them. When I was here the first year, my heart was in my mouth all the time. Every time I'd see a student do something, I'd run in there and say, 'No, you're going to get hurt.' Now, I'm better about just waiting it out and seeing what happens. It's a lot of fun. The students learn, and we have a good time."

This is a very complicated process — an integration of a number of courses.... Students spend many hours on this project and must sacrifice some of their other activities.

Chung Liu, Electrical and Computer Engineering Professor



Here's a look at another group of CSUF students. They have a good time, too. In fact, they claim to have an *"a-mazing"* time. These engineering students, a.k.a. the Micromouse Design Team, work long hours in the design lab in pursuit of the perfect robot rodent. Combining artificial intelligence with robotics research, these students and their adviser, electrical and computer engineering professor Chung Liu, have created *"Micromouse."*

Liu explains that their mission is to program Micromouse to solve a 10-by-10-foot maze in the least amount of time. The self-contained, intelligent rodent *"feels"* its way through a maze and memorizes the correct path after two passes. On the third run through the maze, it can *"crawl"* from start to finish without bumping into a wall or making a wrong turn.

"This is a very complicated process — an integration of a number of courses," Liu says. *"The students must have a background in electronics, programming, mechanics, some math and a lot of strategical knowledge. They spend many hours on this project and must sacrifice some of their other activities."*

Team members Wane Wier, Reginald Smith and Dennis Zweigle are quick to agree with Liu about the number of hours they must dedicate to this project. After all, designing Micromouse is not just fun and games.

The memory system that guides Micromouse consists of *"brains,"* a microprocessor that takes in data as it moves through the maze on the first and second runs and uses that data to determine the shortest route when it makes the third run. Micromouse needs *"eyes,"* sensors to detect walls. Moving through the maze, it projects beams of infrared light from its base. When a wall interrupts any of the beams, Micromouse stops, memorizes the obstacle's location, turns and moves on. Its *"legs"* must have a motor drive circuitry that can be precisely controlled by the microprocessor.



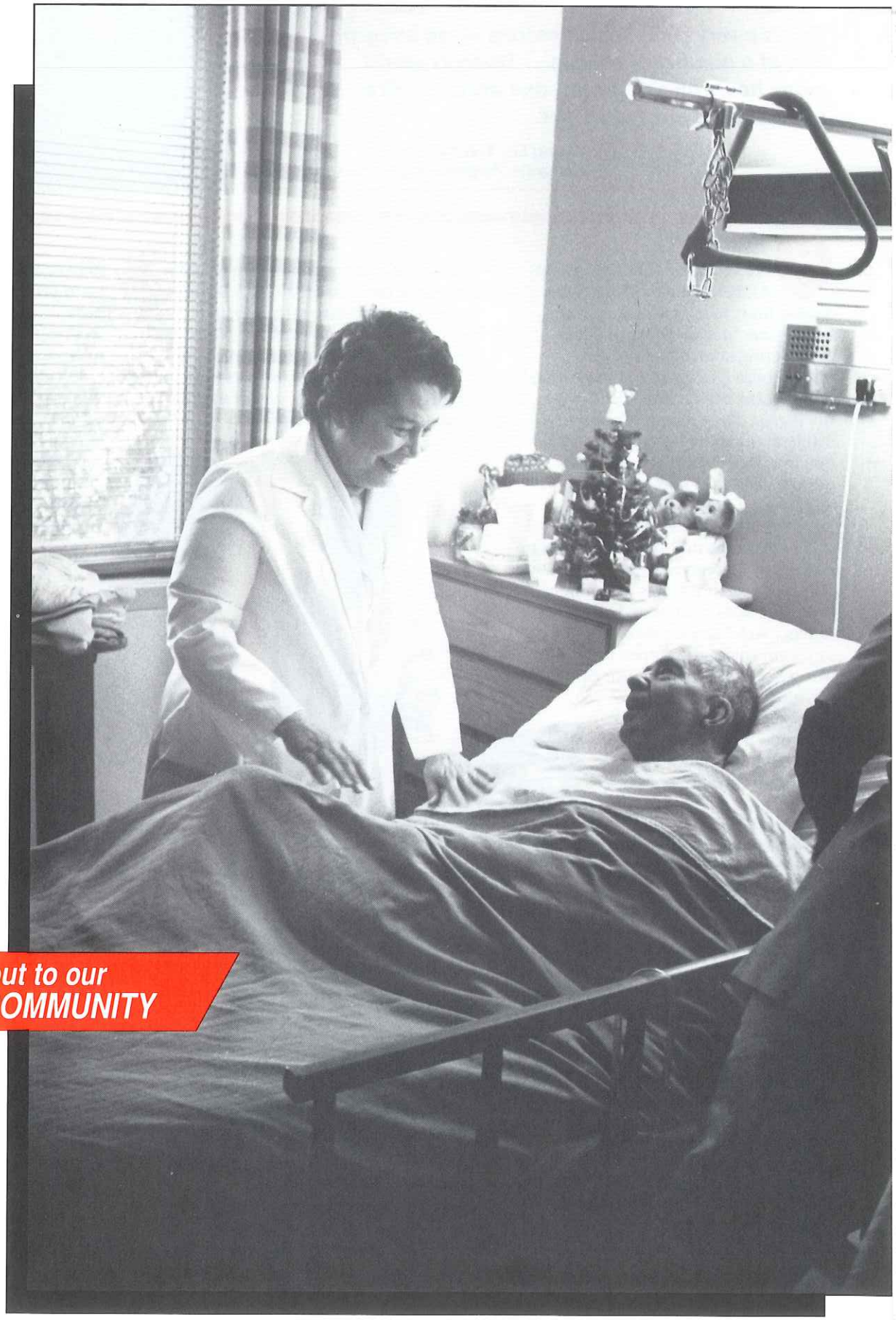
Discussing robotics research in anticipation of the intercollegiate Micromouse competitions are electrical and computer engineering professor Chung Liu and Micromouse Design Team member Wane Wier.

As expected, Micromouse needs *"cheese,"* its own internal power supply — batteries — to provide energy for the electronic circuits. And finally, the mechanized mouse must be in a weight-control program since a lighter robot can solve a maze more efficiently.

The Amazing Micromouse Maze Contest, sponsored by the Institute of Electrical and Electronics Engineers (IEEE), is held concurrently with the annual regional IEEE student paper and device contest. International and intercollegiate Micromouse competitions are held as well.

Chung Liu says that even without the competitions, Micromouse provides students the opportunity to apply classroom blackboard theories to actual devices. The knowledge and practical experience gained are valuable supplements to engineering students, who may later want to transfer this knowledge to dozens of industrial and domestic applications. Chips of artificial intelligence could be used in the future to guide vacuum cleaners and, possibly, even farm machinery.

As an associate professor of nursing, Filomena Flores *touches* the lives of the sick, handicapped and elderly. At the V.A. Medical Center, she brings comfort to our nation's veterans.



. . . Reaching out to our COMMUNITY



All it takes is a different teaching approach. I understand it because I'm a minority myself; I know how they feel.

Filomena Flores,
associate professor of nursing,
on helping students from diverse backgrounds realize their potential

It was an early December morning. For most of us the day hadn't even begun, but that was not the case for Filomena Flores. She and two of her nursing students were already making their rounds at the Veterans Administration Medical Center.... That's when we saw her.

The associate professor's white jacket fluttered in the breeze created by her brisk walk. Wordlessly, she guided her students so the patients were unaware of their inexperience. She greeted everyone with a warm, caring smile — the kind of smile we like to see on the faces of the nurses who take care of us when we are sick or hospitalized.

Filomena Flores understands the concept of *"reaching out."* She does it all of the time — in hospitals, in nursing homes, and in her classrooms and labs. She reaches out to her patients with a tender hand, and then offers that same hand to her students, teaching them invaluable lessons they couldn't possibly learn from their textbooks.



Nursing students Bernadette Guevara (left) and Nancy Kwong-Rasmussen discovered that laughter *is* the best medicine, especially when it's provided by the patient. Sharing this moment is associate professor Filomena Flores (far right).

Recalling her own educational experiences in her homeland, she explains, *"In the Philippines, one cannot become a teacher of nursing without taking education courses. I studied the principles and practices of teacher education. Consequently, I use conceptual methods, teaching students similarities and differences of diseases, for example."*

However, similarities and differences aren't limited to the *"lesson of the day."* Professors are constantly challenged by the everchanging make-up of the student body. In five short years, Flores has seen an astonishing increase in minority students enrolling in the nursing program. Today, Hispanics, Asians, and African-Americans sit in 47 percent of the chairs in her classroom, compared with four or five minority students per class in 1985.

Because of language barriers and, in some cases, differences in social and economic standings, these students sometimes need help with the difficult courses that are required early in the nursing program. But Flores, a pioneer in the field of educating minority students, asserts that they have as much potential as their American-born counterparts.

"All it takes is a different teaching approach," Flores says. *"I understand it because I'm a minority myself; I know how they feel. English-speaking students find it easier to understand or grasp what's in a textbook or what is explained because this is their language. But ethnic students require a special way of teaching. When I write a difficult word on the board, I ask them what it means to them, so there will be a literal understanding.*

"I don't want to say that ethnic students are not bright," she continues, *"because they receive some of the best grades in class. I speak for those who came to this country when they were older ... those who were not born here. Imagine, nine years ago some of these were non-English speaking students. Now, they're in a nursing program, with all of its difficult terms, and they're succeeding."*

They're succeeding because of people like Filomena Flores, who is interested in *all* of her students and finds herself putting in extra hours to tutor anyone who seeks help. She established the Faculty Support Program that provides supplemental review classes for first-year nursing students. Students who have participated in this program have raised their grades significantly.

But Flores doesn't stop here. In addition to the review classes, she encourages students to meet with her on a one-on-one basis. Student demand for this type of tutoring is substantiated by her appointment schedule; it's booked to the max.

"What did I get myself into?" she asks, admitting that it's not unusual for one lesson to be repeated six or seven times. *"You see, I've presented the material in class. Then I have to do it again and again."* Looking up from her desk, Filomena Flores reveals that warm, caring smile and continues, *"But when I see the joy in their faces because they were able to understand the lesson ... and when the grades are out, and they squeal with delight, 'I made it' ... that, to me, is why I do it."*



The sculptured triangles near the Conley Art Building was the setting of a "photo shoot" that included Staff Assembly Executive Committee members: (front, from left) Donald Miyasaki, Becky Youngs, Sally Cardell, (second row, from left) Wanda Patton, Vicki Veen, (third row, from left) Carolyn Odums and Doris Payne, (last row) Michael Feist.

. . . Reaching out to EACH OTHER



When I received the Outstanding Female Employee of the Year Award, I was totally shocked. Every public employee makes a commitment to put part of themselves into their job. When people realize what you have done to receive such an award, that makes it very special. I have thoroughly enjoyed the challenges and the excitement of working in the Division of Graduate Studies and Research. As I have grown, so have the Division, the students and the faculty it serves. While this is reward enough for my accomplishments, this award brings special meaning to me in that it represents the collective efforts of an outstanding institution and its dedicated employees.

SHIRLEE FULTON
Clerical Assistant
Division of Graduate Studies and Research

Who better reaches out to the university community than the ever-dependable men and women who comprise the CSUF Staff Assembly? Yes, they are part of this community — a large and important group of staff members whose efforts reflect more than just service and support. It's service and support with dedication and a commitment to making this university function as a cohesive entity.

"We are here to serve as a linkage among university staff members and to enhance relationships with students and faculty," says Becky Youngs, chair of the Assembly. *"That's what we're all about. The Staff Assembly enables us to have a better relationship with the members of this community."*

Contributing their share toward this end are the Assembly's members — more than a thousand full- and part-time employees — guided and prompted into action by an eight-member executive committee. In all of their activities, students and faculty alike are welcomed to participate, making the Staff Assembly an organization that exists not in isolation from but in partnership with the rest of the university community it belongs to.

Its establishment in 1983 paved the way for staff employees to participate more actively in university-related activities. Youngs says that belonging to this organization has made staff members more aware of the community they serve and support, resulting in better relationships with faculty members and the student body.

"Our varied activities have boosted morale among members because the Assembly enables us to feel that we are an important part of the community," she adds. Such activities include participating in university committee assignments, acquainting new staff members with the campus, and organizing social and fund-raising activities.

Reaching out to others has become a key element in the Staff Assembly's activities. Beneficiaries of its blood drives, for example, include not only the University Health Services but the Fresno Blood Bank as well. Moreover, the Assembly has addressed the interests of the staff in personal and professional affairs by encouraging camaraderie and providing peer support services. One of their annual activities that has attracted much attention is the search for two outstanding employees. Last year's honorees were Shirlee Fulton of the Division of Graduate Studies and Research and Neil L. Kuykendall of the Biology Department.

It's like a spider web of benefits. We reach out to each other as staff members, and the Assembly as a whole reaches out to the faculty, the students, the whole university community.

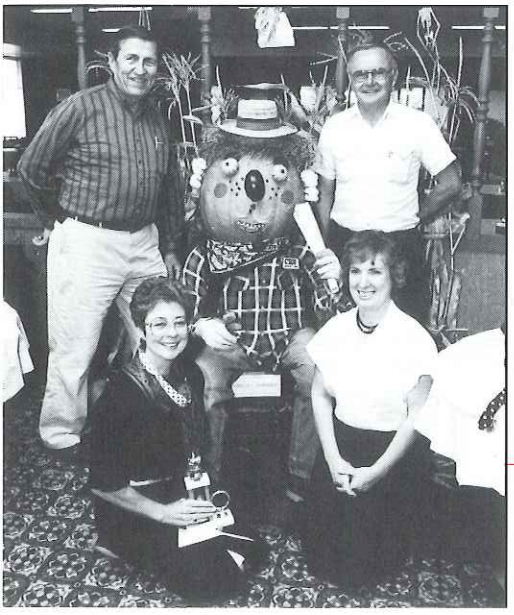
Becky Youngs
Chair, Staff Assembly



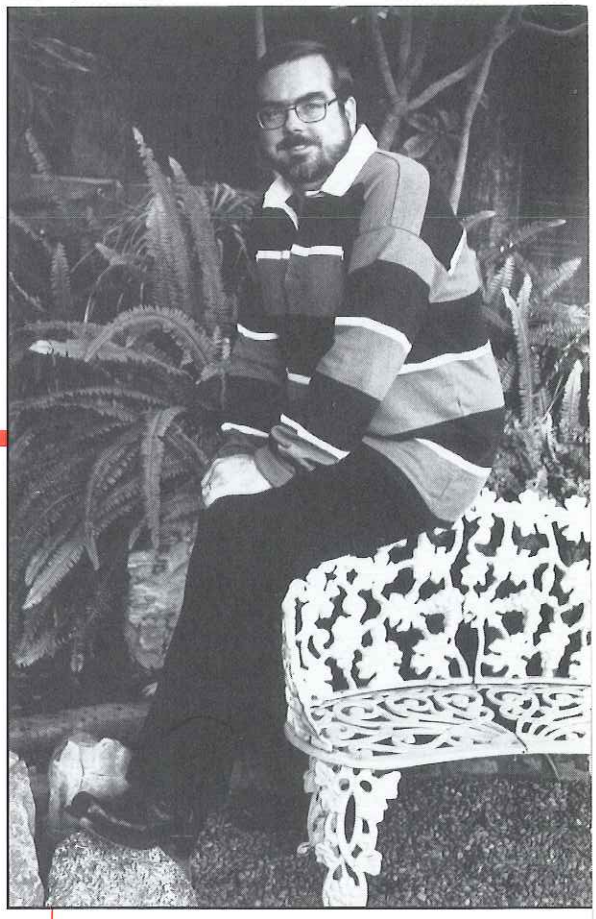
At the Fall Kick-Off Assembly, members of the university community turned their attention to a performance of country-western music after a hearty barbecue treat.

Many view the Assembly as an avenue for meeting other people who work on campus. But the blessings of Staff Assembly-related activities are not reaped by members alone. Better working relationships do create a more pleasant and productive environment for everyone, benefiting faculty members and students in the end.

"It's like a spider web of benefits," Youngs observes. *"We reach out to each other as staff members, and the Assembly as a whole reaches out to the faculty, the students, the whole university community."*



Staff members let their imaginations run wild when they decorated pumpkins for the young patients at Valley Children's Hospital. While Phineus T. Pharmer (center) was the clear winner of the annual Pumpkin Decorating Contest, credit for his victory goes to the many people who kept adding to his physique while he sat on a tractor in the School of Agricultural Sciences and Technology. With Phineus are (clockwise, standing from left) Gene Waterbury, Charles Lee, Shirley Lindal and Jonell Robinson.

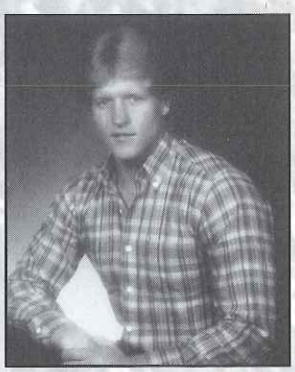


To be recognized by your peers for doing the things you do as an employee is a great feeling. Receiving the Outstanding Male Employee of the Year Award has been a real honor for me as well as a major surprise since my position does not afford many opportunities to work with other areas of the campus. I would like to take this opportunity to thank my fellow employees across campus who felt I was the most deserving of this award. I feel that this program allows all employees the chance to be recognized and sparks the desire to work even harder to make our campus the best it can be. After all, this is why we are here — to create the best environment we can for our students.

NEIL L. KUYKENDALL
Industrial Support Technician
Department of Biology

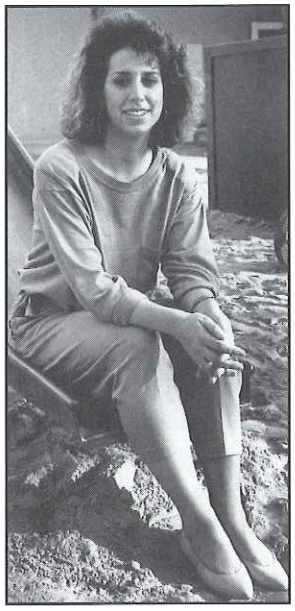
. . . Reaching out to YESTERDAY AND TODAY

Since its founding, California State University, Fresno has attracted students of various backgrounds. Many of those who have done outstanding work on this campus continue to reap merits in their own fields, earning distinction for themselves and for their alma mater. Here, we reach back to some of those former students and gain insight on how attending CSUF made a mark in their lives and careers. And we reach out to today as well — to a sampling of current students actively engaged in that worthy pursuit we call *the educational experience.*



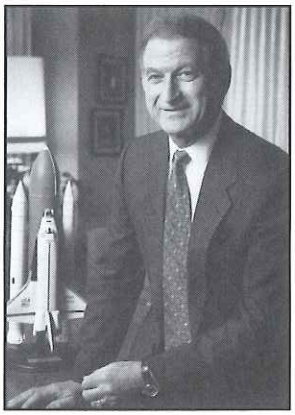
ERIC FOX
B.A. Physical Education, 1987
Baseball Player
Oakland A's Organization

After growing up in Southern California, I had always wanted to go away to college. Fresno offered me this opportunity. I came up here to get a degree, play football and baseball, and find a bride. I'm very happy to say that all three goals have been achieved. I received my degree, played both sports, and met my beautiful wife, Kirsten. All in all, I would say Fresno has been very, very good to me. It's a great city, with great people and a very respectable place to go to school.



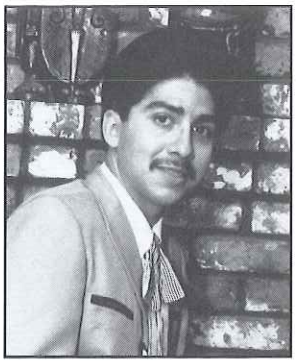
KELLI KELLER
Senior
Liberal Studies Major

One aspect of this campus that I find so unique is its cultural diversity. I have been exposed to many different races, cultures and religions. Before coming here, I never learned about the various lifestyles of others from all over the world.



SAM F. IACOBELLIS
B.S. Mechanical Engineering, 1952
CSUF Alumnus of the Year, 1982
Executive Vice President and
Chief Operating Officer
Rockwell International Corporation

I came to Fresno State on a football scholarship but also had the good fortune to be attracted to the profession of engineering. Like many of my fellow graduates, I found the CSUF training excellent preparation for a job in the burgeoning Los Angeles area aerospace industry and for graduate study at UCLA. Fortune smiled again because this was one of the most exciting times in the industry as we began the manned exploration of space, landed astronauts on the moon, and developed the Space Shuttle. That excitement continues today with plans for ventures like Space Station Freedom, the National Aero Space Plane, a return to the moon, and a trip to Mars. Many factors affect each individual's path in life, but I have no doubt my experiences as a student at Fresno State, and the solid engineering education I received there, were pivotal in mine.



RICHARD B. DELGADO
Senior
Spanish Major
Chicano/Latino Studies Minor

My goal is to become an educator not only to teach Spanish but to teach the history and culture of the Spanish-speaking people as well. I hope to further my education in Chicano and Latin American Studies so that one day I can come back to this institution as a professor teaching the history and fine arts of Mexico.



AGNES GUERARD RODGERS
B.A. Dramatic Arts, 1969
Costume Designer for Films
(Including: "The Color Purple," "Cocoon," "The Witches of Eastwick")

I have very fond memories of CSUF and my beginning work. Entering the Theatre Department was like going through the double doors of heaven. It changed my whole life and gave me exactly what I wanted. My life entered that place of contentment. The instructors were always there with encouragement. I gained great strength and acquired a sense of that magic word "power!" It was the best feeling.



JO-ANN YEOH
B.S. Business Administration, 1987
Manager
KGK Associates — Management Consultants
Malaysia

Studying at CSUF made me realize that, in most cases, an individual's success is largely dependent on the individual's hunger to learn and willingness to work hard with an open mind, with support from friends and from other willing individuals. At CSUF, they were my professors and counselors, the administrative staff and management, my work and college colleagues, as well as my foster parents. This paved the way for my life in the real world — unsheltered by text-books and professors.



CINDY L. ROLDAN
B.A. Liberal Studies, 1988
Kindergarten Teacher
Clovis Unified School District

By attending CSU, Fresno, I was able to learn of the many avenues I have to choose from — both in my personal life and career. In fact, I have decided to pursue an advanced degree while continuing to teach kindergarten at Valley Oak Elementary.



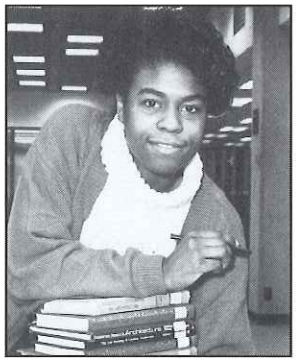
SALLY J. BECKER
B.A. Biology/Zoo Husbandry, 1979
Animal Health Technician
Program Director
San Joaquin Valley College

My years at CSUF brought me in daily contact with many wonderful instructors. Their motivational skills, knowledge, and encouragement enabled me to maximize my potentials and focus my goals. Years later, I drew upon many of their techniques to help motivate and encourage my own students. My degree has allowed me to move ahead in my career, gain vocational teaching credentials, and promote the field of animal health by passing on to others some of my knowledge and skills. I believe education is an ongoing process, and I look forward to keeping CSUF an integral part of my life by continuing to pursue my educational goals.



ROY CHRISTOPHER
A.B. Speech, 1957
M.A. Speech, 1961
Emmy Award-Winning Production Designer/Art Director

How lucky I was to attend CSUF! I could not have found a more creative, supportive and challenging environment in which to grow. Whatever talents I possessed were nourished and molded by the remarkable faculty. They gave me the opportunity to act, write, direct, and design to my heart's content, which enabled me to develop the skills I rely on to this day in my professional work. My experiences as both an undergraduate and graduate student at CSUF affected my life, both personally and professionally, in the most positive ways.



SANDRA LEE
Junior
Industrial Technology Major

Being a part of this institution of higher education has inspired me to do my best. Of course, long and intense hours of studying come in a package that includes burning the midnight oil. I do know, however, that pursuing an education will definitely enhance my future.



SOURCES/RESOURCES

Activities and Student Development

Office of Student Activities and University Student Union
Student Affairs/CSUF Association

University Student Union, Room 306
(209) 278-2741/278-2938
Director, Steven S. Mortensen

Involvement in your college life means that you take part in shaping your learning experience. When you apply your academic training to areas outside the classroom, meet new friends and explore campus life, you expand your personal skills.

Student Activities and University Student Union

The office, situated in the center of the campus in the University Student Union, is responsible for the Union and Satellite Student Union, co-curricular student activities, recreation and intramurals, and provides information about student groups and major student programs. The office issues permits for use of the Activities Plaza (Free Speech Area), recognizes student organizations, reserves campus facilities for student use, and assists students and their groups in planning activities and developing their programs.

Student Organizations

More than 200 student organizations provide CSUF students ways to make new friends, create programs of special interest, develop leadership skills and work together toward common goals. Organizations can be contacted at the Student Activities Office.

Recreation and Intramurals

Funded jointly by your Associated Students fees and the university, the recreation and intramural program is designed to serve the recreational and physical fitness needs of students, faculty, staff, active alumni, and at limited times, the general public. Information on team sports or recreational use of the physical education facilities can be obtained from the **North Gym, Room 109, 278-2526.**

University Student Union and Satellite Student Union

The Union is primarily supported by student body fees. Therefore, students play an active role in the governance of the Union by serving on the University Student Union Board and/or one of its committees: budget, program, or services and facilities.



The annual celebration of spring occurs during Vintage Days. Competitive events, a campus parade and a craftsfolk faire are a sampling of the activities that take place during this four-day event. Planned by a student committee, Vintage Days draws about 75,000 people to the campus in late April.

Union facilities include a recreation center that has billiard tables, 12 bowling lanes, pinball and video games, and an outdoor recreation area; a coffee shop, known as "The Pit"; and the Country Store, which offers gourmet coffees and fresh baked pastries.

The Satellite Student Union is an all-purpose entertainment and cultural center able to accommodate about 830 people.

University Student Union Programs Committee

The University Student Union Programs Committee is a group of 12 students charged with scheduling, promoting and producing a wide range of student programs — from classical arts to contemporary music. Applications for committee positions are available the first part of September in the Student Activities Office.

Fraternities and Sororities

Fraternities and sororities have existed nationwide for more than 200 years and for more than 50 years in Fresno.

Sorority Rush is usually held in August, and Fraternity Rush occurs in September and again in February. For information, contact the Student Activities Office.

Associated Students Inc.

The Associated Students Inc. of CSU, Fresno is a nonprofit corporation chartered by the Trustees of The California State University to operate a student government and its sponsored activities. As a student, you are automatically a member of the Associated Students. The mandatory membership fee is $16 each semester. The fee supports recreation and intramural sports activities, publications, cultural programs, a child care center, and a variety of multicultural festivals and programs. For information, call the **Associated Students Office, University Student Union, Room 316, 278-2657.**

Campus Children's Center

The Campus Children's Center accepts a limited number of children, ranging in age from six months to six years, for care during the school day. For information, call **278-2652.**

Student Affairs
Office of Advising and Orientation
Joyal Administration, Room 219
(209) 278-2924
Director, J. Richard Arndt

The Office of Advising and Orientation provides a variety of services designed to help you achieve your educational goals and effectively use the resources of the university.

Our office staff assists you in undergraduate academic advising, undeclared major advising, new student orientation, academic petitions procedures, change of major services, general academic problem solving and appropriate referrals. You may also come to our office when seeking answers regarding university policies and procedures.

Peer Advising

Peer advisers are available by appointment and on a walk-in basis at the beginning of each semester. Peer advisers can help you interpret your transfer evaluation, answer questions related to policies and procedures, and explore with you how the General Education and major requirements and elective units complement each other.

Major Advising

Advising in specific requirements for a major, minor or teaching credential is done by the various departments. You should meet with your faculty adviser at least once each semester before you register for classes. Depending on your major department's procedures, an adviser will be assigned to you or selected by you. A close working relationship with your major adviser and other department faculty can help you determine your program and choose appropriate experiences related to your academic and career goals. However, the ultimate responsibility for knowing and meeting all graduation requirements is yours. Therefore, you would be wise to check each semester's grade report and your evaluation for correctness (see *Baccalaureate Degree Requirements*).



Undeclared Major Advising

Undeclared majors are advised in our office. Our advisers can suggest faculty contacts in the academic departments who will help you determine which resources on campus to pursue. Also, experienced vocational counselors are available in the Career Development and Employment Services Office where you will be assisted on an individual basis with the appropriate use of vocational testing when necessary.

New Student Orientation

All newly-admitted undergraduate students should attend the new student orientation program provided by our office. One-day programs are conducted each summer for new students who plan to enter in the fall, and two Advising Day orientations in November and January are held for students entering in the spring semester. These sessions include academic advising, information on degree and General Education requirements, transfer evaluation procedures, university policies and procedures, registration procedures, and an overview of student and instruction-related services.

The university also offers the following course:

Univ 1. Introduction to the University (1–3). Helps the entering student make a smooth transition into the university culture and deals with the purposes of higher education and with strategies for achieving one's educational goals.

Academic Petitions

Students must file academic petitions in our office. For further information, see *Student Academic Petitions.* Grade Correction Request forms are also submitted to our office for processing. Petition forms for repeating a class and substituting the new grade are obtained in the Joyal North Lobby (see *Repeating Courses*).

Change of Major

To change your major, initiate the procedure in our office. Graduate (including all postbaccalaureate students) and international students should process major changes in their respective offices.

Special Major Advising

An undergraduate student interested in designing a special major initiates the process with an appointment to obtain an application form in our office. A graduate student interested in establishing a special major at the master's level should consult the Graduate Dean (see *Special Major for the Bachelor of Arts Degree* and *Special Graduate Programs — Special Major*).

Exit Interview

If you are considering leaving the university at the end of the semester for any reason other than graduation, check with our office to make sure of your options and to complete the necessary administrative procedures.

Alumni Association

CSU, Fresno Alumni Association Inc.
Joyal Administration, Room 148
(209) 278-ALUM
Executive Director, Linda Van Kirk

The CSU, Fresno Alumni Association serves as a vital link between the university, its alumni and the greater Fresno community. Its primary purpose is to develop and apply its funding and volunteered-time resources toward the advancement of higher education and enhanced communication among alumni, campus administration, students and friends.

The Alumni Association's continuing goals are to provide scholarships to undergraduate and graduate students and to support campus improvement projects. The association is governed by a volunteer board of directors.

In addition to sponsoring student scholarships and the annual reception for alumni scholarship recipients, the association hosts a Golden Grad Reception each year to honor graduates of 50 or more years and celebrates at an annual homecoming tailgate party for all alums and friends. Alumni and friends also enjoy an evening at the theater in February. In the fall, Alumni Loyalty Fund appeals are made to encourage support of association projects.

The CSUF Alumni Association has grown and matured along with the university. The Alumni Association network links together more than 2,600 members. CSU, Fresno alumni represent 56 academic areas of study and have migrated to every state in the nation.

In an ongoing effort to serve members, the Alumni Association offers many member-only discounts and privileges, including group health and life insurance rates, use of CSUF's recreational facilities, discounted admission for various university events and library privileges at all CSU campuses.

Membership is open to graduates and friends of the university. Annual dues are $15 for new graduates, $25 for single membership and $35 for joint membership (husband and wife). Life memberships are $200 and $300 respectively. Business memberships are also available.



Alumni director Linda Van Kirk and Alumni Board member Gary Yamamoto display their alumni wares at commencement.

Contact/Alumnac

Contact is a quarterly news magazine mailed to all alumni and friends with whom the association is in touch. Each issue features an *Alumnac* section, which highlights the accomplishments of CSU, Fresno alumni. *Contact/Alumnac* also details events and activities.

Student Services

The Career Exploration Network. The Career Exploration Network was established by the Alumni Association to create opportunities for students to explore different careers. The network is comprised of community professionals who provide students with the opportunity to gather information, receive candid answers to job questions, observe a specific work environment, and assess both the pitfalls and the benefits of a particular profession.

Student Alumni. The Student Alumni Association offers full benefits of alumni membership. Additionally, the Student Alumni Association will host seminars, workshops and social events throughout the year. Monies raised through this joint student/alumni venture benefit Student Alumni projects and scholarship programs. Telephone 278-ALUM for further information.

Yearbook Program. The campus Yearbook Program is coordinated by the Alumni Office. If you are a senior, be sure to watch your mail or the *Daily Collegian* for notices of *when* and *where* photographs will be taken for the Yearbook. Photographs are taken once each semester, free of charge. You can purchase your yearbook for about $20 (includes postage).

Scholarships

Students at CSU, Fresno may apply for Alumni Scholarships through the Financial Aid Office. Awards are made to undergraduate and graduate students based on need, scholarship, leadership and involvement. Funds for scholarships are managed by the CSU, Fresno Alumni Trust Council. The Trust Council oversees the investment of the Alumni Association's contributions and the distribution of its scholarship funds.

Your Alumni Association is a dynamic organization whose programs and services are designed to meet the variety of needs and interests of its alumni while providing support to the university. If you have an interest in and commitment to the growth and future of CSUF and the community it serves, call the Alumni Association. They believe *you* make the difference!

Athletic Department
School of Health and Social Work
North Gym, Room 146
(209) 278-2644
Director, Gary A. Cunningham

Academic excellence and athletic accomplishment go hand in hand at California State University, Fresno. The intercollegiate athletics program, with 11 men's teams and seven women's teams, provides student athletes with opportunities for high-level competition while pursuing a quality education.

To ensure academic development, CSU, Fresno — known in the athletic world as Fresno State — has instituted a counseling system designed specifically for student athletes. Services include academic advising, guidance and counseling, monitoring of progress and daily study halls.

Facilities

Community support and donations have enabled Fresno State to establish one of the finest athletic complexes in the country. Bulldog Stadium features a 30,000-seat capacity. Beiden Field, a 4,575-seat baseball stadium, is ranked as one of the largest collegiate facilities in the nation. FSU has softball and track and field facilities, two gymnasiums, an indoor/outdoor swimming complex, two weight training rooms, 12 tennis courts, six indoor handball/racquetball courts, and two putting greens and driving areas complete with sand traps for golf.

Men's Intercollegiate Athletics

Baseball. Fresno State has earned a national reputation for having one of the finest baseball programs in the country. Head coach Bob Bennett's Bulldogs, who advanced to the 1988 College World Series, are consistently ranked in the Top 20. They have qualified for the NCAA playoffs on 17 occasions.

Basketball. The new Bulldog's head coach, Gary Colson, ranks as the 12th winningest active collegiate head coach, with a record of 487–312. CSUF has made five postseason tournament appearances in the past 10 years.

Cross Country/Track and Field. Coach Red Estes has guided FSU to seven straight Big West track titles and cross country titles in 1981, 1984 and 1988.

Football. The Bulldogs compete for the Big West Conference championship and a trip to the California Bowl, hosted annually in Bulldog Stadium. They continually provide students and the community with action-packed football in a winning tradition, selling more than 27,000 season tickets in 1987, 1988 and 1989. Under the direction of head coach Jim Sweeney, the Bulldogs captured the conference championship in 1977, 1982, 1985, 1988 and 1989. The 1985 Bulldogs were the only undefeated team in major college football, finishing the season 11–0–1 and ranked 16th by UPI. Fresno State has produced many NFL prospects.

Golf. Coach Mike Watney guided the Bulldogs to a No. 3 NCAA ranking in 1987. Watney has produced 15 All-Americans and a Top 20 team at the NCAA Championships in seven of the past 11 years.

Soccer. Tenth-year head coach Jose Elgorriaga has guided the Bulldogs to six NCAA regional appearances, a Final Four showing and a No. 1 ranking during the 1987 regular season.

Swimming and Diving. Head coach Teri McKeever coaches both the men's and women's programs, a first for FSU.

Tennis. Current U.S. national team assistant coach and fourth-year head coach Brad Stine coaches a growing program that has produced 215 wins in the past 18 years.

Water Polo. Consistently ranked in the Top 20 nationally, the water polo team is coached by Tom Milich, an assistant coach for the 1992 U.S. Olympic team.

Wrestling. Head coach Dennis DeLiddo is the winningest wrestling coach in FSU history (109–61–2). DeLiddo has coached six All-Americans in his eight seasons.

Women's Intercollegiate Athletics

Basketball. Ninth-year head coach Bob Spencer became the first coach in NCAA history to reach 500 career wins (518–214).



Bulldog quarterback Mark Barsotti

Cross Country/Track and Field. Head coach Tom Pagani, who coached the Olympic throwers in 1988, has built a powerful track and cross country program at Fresno State.

Softball. Fresno State softball is coached by fifth-year coach Margie Wright. In 12 years, the Bulldogs have grown into a national powerhouse, having appeared in 11 straight regional playoffs. The 1982, 1988 and 1989 seasons produced a second-place finish at the NCAA Softball College World Series.

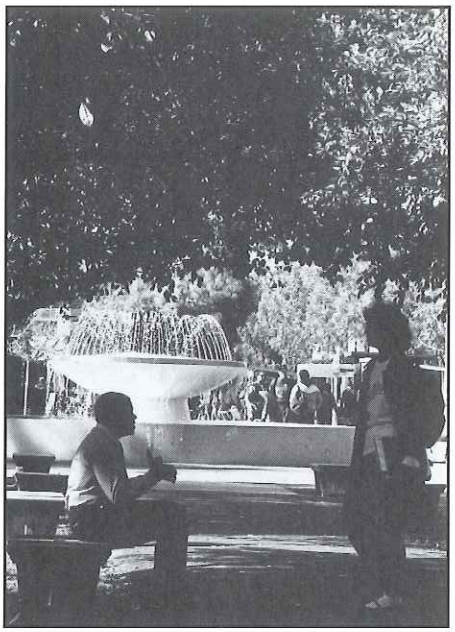
Swimming and Diving. Dedication and hard work are characteristics of a solid swimming and diving program under third-year coach Teri McKeever, a two-time All-American swimmer at USC.

Tennis. The women's tennis program is coached by first-year boss Irene Harris.

Volleyball. Head coach Leilani Overstreet led her squad to a 26–13 record and a fifth place finish at the 1984 NCAA Championships.

Auxiliaries

Auxiliaries
University Student Union, Room 302
(209) 278-2574
Director, Gaylord O. Graham



The Office of the Chancellor for The California State University system has authorized each campus to establish non-profit organizations to assist the campus in administrating areas where funds are generated from non-state sources. The following auxiliary organizations provide direct and indirect services for CSU, Fresno students.

The Agricultural Foundation of California State University, Fresno

The Agricultural Foundation of California State University, Fresno was organized in 1954 to operate the university farm and student project program for the School of Agricultural Sciences and Technology. The Agricultural Foundation leases the 1,083-acre farm from the university and, in addition, operates the San Joaquin Valley Experimental Range of more than 4,000 acres situated on Highway 41 south of the town of Coarsegold. It is governed by a board of governors consisting of the university president and 24 members of the community who are nominated by the university president and elected by the board of governors.

The Agricultural Foundation provides the funding, the land, animals, orchards, vineyards, etc. for students to receive practical experience in agriculture. Students in the student project program receive units of credit for their experience and also participate in any profit earned from their projects.

In addition, the Agricultural Foundation, by maintaining herds of cattle, both dairy and beef, horses, sheep, swine, and by growing all types of crops on the university farm, provides the laboratory experiences needed by students in the School of Agricultural Sciences and Technology. This must be done on a self-supporting basis with the income from the farm meeting the costs of its operation.

California State University, Fresno Association Inc.

The CSU, Fresno Association Inc. is a nonprofit corporation, organized in 1921, which functions to enhance the educational goals of the university. Through the operation of the Kennel Bookstore, the University Student Union and the campus Food Services, as well as through the support of various university projects, the association is a major contributor to the university; and so are you when you patronize these campus facilities. The money you spend, after expenses are met, is directed right back into university projects.

The association is governed by a board of directors that includes the university president or his designee, vice president for administration and external relations, dean of student affairs, the chief financial officer, president and administrative vice president of the Associated Students, a faculty member and a layperson. The board must meet at least once each quarter, and anyone is welcome to attend. The paid staff operate the facilities in accordance with the rules and regulations established by the board of directors.

In addition, there is a University Student Union board, a bookstore advisory committee, and a food service committee to assist those areas in their operations.

Surplus funds generated in excess of required reserves for working capital, capital replacements and future operations are used for the benefit of the entire campus. When you see the following facilities and services, think of the CSU, Fresno Association Inc.:

- The University Student Union building, the Satellite Student Union building, the Kennel Bookstore, the Keats Campus Building.
- Ramps, automatic doors and elevators for use by the handicapped.
- The Residence Hall swimming pool.
- The all-weather track.
- The campus amphitheater.
- Campus lighting and beautification projects.
- Signs and landscaping on Maple Avenue.

The California State University, Fresno Athletic Corporation

The California State University, Fresno Athletic Corporation was organized in 1982 as a nonprofit corporation to administer the men's and women's intercollegiate athletic programs of this university. The board of directors, composed of faculty, administrators, laypersons and students, exerts budgetary control and determines management policies.

California State University, Fresno Foundation

The California State University, Fresno Foundation was organized in 1931 as a nonprofit corporation to promote and assist the educational interests and services of the university. It is governed by a board of governors consisting of the university president and 12 members of the community who are nominated by the university president and elected by the board of governors.

The foundation actively seeks additional funding for those activities necessary to maintain excellence within the university, but for which state monies are inadequate or nonexistent. Additional activities of the Foundation includes the administration of grants and contracts, endowments, scholarships, grants and loan funds.

Career Development and Employment Services

Student Affairs
Career Development and Employment Services
Joyal Administration, Room 267
(209) 278-2381
Director, Raymond I. Castillo

The Career Development and Employment Services Center assists you in formulating a career development plan that will permit you to put your education to work in a satisfying and rewarding career field.

The center provides services that help you initiate, develop, evaluate and implement your career plan. Services include career counseling, part-time employment, cooperative education, job search training, campus career interviews and career information provided through ongoing workshops, coursework and other structured experiences. The service is free to enrolled students and is available to alumni for a nominal fee. To receive assistance, telephone 278-2381 for an appointment or see an intake counselor for consultation on a walk-in basis.

Career Exploration

Ideally, the career decision-making process should begin as soon as you enter college. Consider talking with a career counselor, joining in self-exploration and career exploration classes and workshops, and using the career information resource facility. Career testing, the Career Information Network and Career Day are other important resources available to help you evaluate and select career goals compatible with your academic choice and career interest.

Career Resource Center

The Career Resource Center provides information on career exploration and decision making, on requirements for careers, on specific employers, and on job search and employee selection through books, periodicals and videotapes. Two computer-assisted guidance systems are also available to aid you in making career decisions. The System of Interactive Guidance and Information (SIGI-PLUS) helps you identify and prioritize work values, suggests occupations that meet those values, gives specific information about occupations of interest, provides an overview of entry-level requirements and aids in weighing the risks of entering an occupation against the satisfactions it would provide.



Career Day is for everyone — freshmen to seniors. It's a day when representatives from business, industry, government and education are ready to discuss your career interests and opportunities. This October event attracts about 100 organizations.

The computerized California career information system, called EUREKA, can help you learn more about occupations that relate to your interests and abilities. EUREKA's memory banks are filled with information describing more than 400 occupations — including job descriptions and employment outlook — training programs to prepare for specific occupations, and colleges and universities offering desired areas of study.

Cooperative Education

Beginning with your sophomore year, you should take advantage of the center's facilities to further reinforce your career decision through cooperative education classes and work environment experiences. In addition to giving you the opportunity to gain marketable work experience, you are able to test your career decision. To prepare you for the co-op experience — and also for entry into the employment market — the center offers a continuous program of personal job search, career planning development, employment communication skills development, and interview skills and techniques education.

Employment

Career employment can be obtained from current employment listings, from national, regional and local organizations that actively recruit graduates through campus interviews, and from job fairs. The center also maintains an active program designed to effectively assist teachers and other education professionals in obtaining positions throughout all levels of education.

If you are interested in part-time, temporary, summer or cooperative education employment, the *Student Employment* section can assist you. You are encouraged to review the employment listings frequently because information on new positions is received daily. (See *College-Work Study Program* and *Graduate Assistantships.*)

Alumni Assistance

The center offers a full range of services to alumni for an annual fee. Alumni are defined as persons who have completed requirements for a degree, a credential program or a minimum of 24 units of credit at CSU, Fresno.

Computer Services

Computer Services
McKee Fisk, Room 137
(209) 278-3923
Director, James Morris

Computer Services supports the computing needs of CSU, Fresno with a wide range of resources and services. In addition to providing support for instructional and administrative computing, office automation, data communications, and equipment maintenance and installation, Computer Services offers individual consultation and a series of survey and in-depth workshops for faculty and staff on a variety of computing topics.

Administrative Computing

The campus administrative systems — such as student records, scheduling, business and accounting — run on an IBM 3090 mainframe located in the McKee Fisk computer room. Computer Services provides programming and operating support for all administrative computing at CSU, Fresno.

Networking

CSU, Fresno has recently installed a new data communications network which supports high-speed access to the major university computing resources from every office and laboratory on campus.

Computing Laboratories

For students, Computer Services manages several general purpose computing laboratories and provides trained student consultants to staff the most-used laboratories for extended hours each week. Most of the IBM PC compatibles and Macintosh microcomputers are networked to file servers and also provide access to the major instructional mainframes.

In addition, several academic departments support their own computing laboratories which house both general purpose and specialty computing resources. Contact the schools and departments for more information about these facilities.



A variety of instructional and administrative computing hardware is housed in the McKee Fisk computer room. Nancy Evenson works with tapes for the instructional DEC VAX 11/785.

In all, more than 600 computer workstations are available in student labs throughout the campus — and this number is growing all the time.

Instructional Computing Resources

Computer Services provides access to the following four instructional computers:

VAX 11/785. This super-minicomputer is one of the most popular found in education and industry. It is mostly used for teaching computing languages and specialized packages in statistics.

Prime 9755. Also a super-minicomputer, this machine is primarily used for specialized applications in statistics and graphics.

Central Cyber 960. This mainframe, which is shared by all the CSU campuses, is located in Los Angeles and supports large data bases and very specialized applications.

ELXSI. This mini-supercomputer is also located in Los Angeles and is shared by all CSU campuses. It is a parallel processing computer, capable of concurrently running four operating systems.

Counseling Center

Student Affairs
Counseling Center
Health Center Building, Area *E*
(209) 278-2732
Director, Esteban Steve Sena

Counselors at the Student Counseling Center assist students in acquiring a wide range of skills in life management, career and life planning, and personal growth and development. Through individual and group counseling, the center provides opportunities for students to discover more about themselves, where they want to go and better ways of getting there.



What is Counseling?

The Counseling Center offers assistance in managing academic responsibilities and successfully completing educational goals through the following specialized activities:

Personal Counseling. Personal counseling provides opportunities to explore anything that is experienced as a need or concern. For example, many students seek help with:

- Relationship concerns such as developing friendships, communicating with others, being assertive, dealing with parents and children, dating, and handling the breakup of a relationship.
- Stress management.
- Dealing with feelings and emotions, including anger, grief, loneliness, anxiety, lack of self-confidence, depression and suicidal feelings.
- Fears and worries about such areas as sexuality, academic responsibility, independence, eating patterns, drug use and cultural differences.

Counseling sessions typically are scheduled for 50 minutes. Students are eligible for up to a maximum of 15 individual sessions each academic year, depending upon the complexity of their issues and counselor availability.

Career Counseling. A variety of career counseling services are available. These include:

- Career life planning strategies.
- Vocational testing.
- Decision-making skills.
- Self-concept and career choice.

Groups and Workshops. A variety of counseling groups and programs are offered. Telephone or stop by for information on current offerings. Groups typically available include stress management, assertiveness, reentry support and eating disorders.

Additional Services:

- Assistance with crisis situations.
- Consultation to student groups, faculty and staff.
- Referral to the Testing Office.
- Referral to other campus and community resources.

Who are the Counselors?

Counselors at the center are professionally trained in counseling, psychology, social work and rehabilitation. The staff represents diverse theoretical styles and a variety of ethnicities. You may ask to talk with a particular type of counselor, such as a male, female or ethnic minority. Regardless of the type of concern or extent of counseling, you can expect to be treated with respect.

Is Counseling for You?

Studying, going to classes and completing degree requirements are only a part of what it means to be a university student. Life has many facets that must be balanced to give the time and energy needed to pursue educational goals. Physical and financial needs must be met, but there are also emotional, social, vocational, recreational, political and spiritual needs to attend to. As if these weren't enough, many people find that student life provides the kinds of stimulation that foster personal growth and development. In capitalizing on the opportunities and challenges, you may go through transition periods in which decisions are no longer automatic, and you find yourself questioning who you are, how to act or what to do.

Although the diverse perspectives and multiple alternatives presented in a university environment can provide a fertile field for learning, change and growth, they also can be overwhelming. If you feel the stress is getting to you, if you want to explore your options, learn decision-making skills and better ways to cope, or just want an objective person to listen, you may want to see a counselor. You don't have to have a serious problem; the normal concerns that accompany the student role are very appropriate to discuss in counseling.

Is Counseling Confidential?

All information is confidential and can only be released with the student's written permission. Some legal and ethical exceptions to this policy will be explained during your first visit.

How Do You Use Our Services?

Come by the center any time between 8:00 a.m. and 4:45 p.m. Monday through Friday (7:30 a.m. to 3:45 p.m. during the summer) or call 278-2732. The Counseling Center is located in the Health Center Building, Area *E*. All services are free of charge.

Dean of Student Affairs Office

Dean of Student Affairs Office
Joyal Administration, Room 224
(209) 278-2541

William H. Corcoran, Dean
Thomas P. Boyle, Associate Dean
Manuel Perez, Associate Dean
Robert E. Lundal, Assistant Dean



The Dean of Student Affairs Office provides leadership, support and resources to the many offices and programs in the Division of Student Affairs.

Included in the division are offices that deal with outreach, reentry, admissions, housing, student activities, intramurals, veterans, disabled student services, international student matters, counseling, advising and orientation, testing, health services, financial aid, and career development and employment.

The Dean of Student Affairs Office is also responsible for administering student grievance procedures, student discipline and maintaining liaison with other administrative and academic areas of the university.

Student Conduct

The Student Code of Conduct (see full text in *University Administration and Policies* section) is designed to ensure that the normal processes of the university — both instructional and administrative — can occur unhindered. In addition to the code, there are a number of local policies that apply to specific groups of students — such as those living in the residence halls.

University, trustee and state regulations governing student conduct are described in the *Handbook for Student Organizations* and the *Student Rights and Responsibilities Manual.* Copies of these, as well as the policy statements relating to cheating and plagiarism, are available from the Dean's Office.

Student Grievance Procedures

A grievance could arise out of a decision or action in the course of official duty by a member of the faculty, staff or administration of CSU, Fresno that is alleged to be discriminatory, contrary to accepted academic relationships and procedures, or restrictive of the rights of any student of the university to fair treatment. The purpose of the grievance procedures is to provide a mechanism for students to have a third party review of the situation.

The student must first make a good faith effort to resolve the matter informally by talking directly with the individual concerned, the individual's direct supervisor (or department chair) and the director of the unit (or school dean). If resolution is not effected through the informal procedures, students should contact the Dean of Student Affairs Office for assistance and for a copy of the formal procedures for filing a grievance.

Cheating and Plagiarism

Also available from the Dean of Student Affairs Office is the full text of the university Policy on Cheating and Plagiarism. Definitions of what is considered cheating and/or plagiarism are found in the *University Administration and Policies* section.

Student Absences

Students are expected to maintain regular attendance at classes. Extended absences (more than one week) due to illness, death in the immediate family or other extraordinary emergencies may be reported to the Counseling Center **(278-2732)**, which will notify the faculty concerned. When any absence occurs, however, the student should contact the instructors involved concerning the possibility of making up the work missed.

Developmental Learning Resource Center

Academic Affairs
Learning Resource Center
Keats Campus Building
(209) 278-3052
Director, David A. Bezayiff

The Developmental Learning Resource Center (DLRC) provides services to all university students who would like to become more independent and efficient learners.

The DLRC houses the Tutorial Center and provides the following programs: Progress and Advancement through Special Services (PASS), Intensive Learning Experience (ILE), Refresher Workshop and Retention Support Services.

The following courses are offered by various departments in coordination with the DLRC for institutional credit only (*CR/NC*).

Reading Skills: (T Ed AR) Emphasis given to vocabulary development, comprehension and reading rate. Particularly recommended for students who score 135 or below on the reading portion of the EPT. (See *School of Education — Interdepartmental Courses.*)

Study Skills: (Spch AR) Development of communication skills necessary for successful learning in a university. (See *Speech Communication Courses.*)

College Planning Skills: (T Ed 1R/S Wrk 1R) College Planning Skills: A seminar designed to address the educational needs of those students who may be experiencing difficulty in their academic and personal adjustment to university life.

Tutoring Skills: (T Ed 101) Practicum in Tutoring: Development of skills in tutoring individuals and small groups and methods on how to train tutors. T Ed 101 counts toward a B.A. degree.

Noncredit Refresher Course: The DLRC offers noncredit workshops to help students prepare for various standardized examinations including the California Basic Educational Skills Test (CBEST), the Graduate Record Examination (GRE) and the Entry Level Math Examination (ELM).



Tutorial Services

Currently enrolled CSUF students are eligible for free tutorial assistance in the LRC Tutorial Center. Study groups are matched for 1½-hour weekly sessions with CSUF faculty-recommended student tutors. Additionally, drop-in labs in accountancy, chemistry, decision science, finance, management, math, physics, Spanish and writing are available, as well as evenings in the residence halls.

Intensive Learning Experience

The Intensive Learning Experience Program (ILE) provides additional assistance to freshman students who scored at or below the lower quartile on the English Placement Test (EPT) and the Entry Level Math Examination (ELM). This program features a teacher-student ratio of one to twelve per class and special counseling and advisement.

In addition to enrolling in English A, freshman students who score at or below T141 or E7 on the EPT are encouraged to enroll in the English A Writing Lab (Engl ARL) and the 1-unit Reading Skills improvement course (T Ed AR). Those who score 340 or below on the ELM should enroll in Math ILR, which covers the same material as Math AR, but at a slower pace.

Progress and Advancement Through Special Services (PASS)

The PASS Program is a free student retention service designed to improve reading, writing and study skills. Students may participate in study groups, receive individualized assistance or enroll in specific courses taught by PASS program specialists. Students must meet eligibility requirements at the time they request services.

Retention Support Services

The Retention Program provides a variety of services designed to assist students from non-traditional backgrounds in achieving their educational objectives. The staff provides direct services to students, including academic counseling, advising and study skills assistance.

Disabled Student Services

Student Affairs
Disabled Student Services
Main Cafeteria West, Room 125
(209) 278-2811
Coordinator, Weldon W. Percy

Disabled Student Services provides specialized assistance and resources that enable students with physical, perceptual and learning disabilities to achieve maximum independence while they pursue their educational goals. Staff specialists constantly interact with all areas of the university to eliminate physical and attitudinal barriers.

Disabled Student Services takes a personal interest in meeting the special needs of our students. If you have a temporary or permanent disability that may affect your academic functioning, you may be eligible for a variety of unique services.

Accessibility Services

Fresno is one of the most accessible university communities in California. The climate is moderate and the flat terrain affords optimum mobility. You can move freely throughout CSU, Fresno's instructional facilities and related areas. Elevators are provided to reach all instructional areas above the ground floor. Accessible restrooms, drinking fountains and telephones are provided across the campus. Portable science laboratory stations and other specialized academic equipment are available for students who are in wheelchairs. Swimming, wheelchair tennis, weight training and other physical fitness activities are available through the Individualized Adaptive Physical Education Program. Other services include special parking permits, access maps and wheelchair loans for those with temporary needs.

Resource Center for Students with Disabilities

The resource center, situated in the Henry Madden Library, is the most efficient and extensive of its kind in California. It contains study rooms and a large main room with special tables.



With a library of braille reference books in the background, senior Tom Randall listens as Rosslyn Holt, coordinator of reading services, reads aloud from a textbook. Holt's words are also being recorded. Textbooks-on-tape is just one of the many services offered to students at the Resource Center for Students with Disabilities.

The resource center offers academic support services to students with physical, perceptual and learning disabilities. These support services may include readers, notetakers, scribes, taped textbooks, braille materials and testing accommodations.

Adaptive equipment includes print enlargers, speech input and voice output computers, a braille printer and other equipment appropriate to the disability and academic activity.

Deaf and Hearing Impaired Services

Our staff acts as a liaison between student and faculty and coordinates interpreter and notetaker needs for academic activities. Services also include TDD (Telephone Device for the Deaf), amplified telephones and speech pathology-audiology referral.

Priority Registration and Assistance

Disabled Student Services can grant you priority status through early registration that will facilitate your requested class schedules.

Student Responsibility

It is your responsibility to arrange for services that are outside the scope of our program. This includes attendant care and special sources of financial aid. However, we do provide referrals to appropriate university, state and community agencies.

Independence for the disabled has become a reality on our campus. We are convinced that your creativity, coupled with our resources, will result in an extremely rewarding educational experience.

Educational Opportunity Program

Student Affairs
Educational Opportunity Program
Joyal Administration, Room 238
(209) 278-3021
Director, Robert P. Hernandez

The Educational Opportunity Program (EOP) is designed to make higher education a possibility for students who have the potential and motivation to achieve academic success with the assistance of comprehensive support services.

Eligibility

To qualify for EOP, you must be a California resident and an undergraduate student with a family history of low income and educational attainment. In addition, you must demonstrate academic capabilities and be motivated to achieve your educational goals. If the combination of your grades, test scores and high school courses do not meet criteria normally required for entrance to the university, special admission may be offered. EOP also admits regularly eligible students with specific economic and educational support needs.

Services for EOP Students

Special services designed to support and assist EOP students in developing their academic potential include the following:

- Pre-admission counseling.
- Orientation programs.
- Special summer program — a four-week, intensive session that focuses on the development of essential academic skills.
- Diagnostic testing.
- Financial aid follow-up.
- Academic advising.
- Tutorial services.
- Learning assistance workshops.
- Counseling.
- Career planning.
- Recreational activities.



Happy to be at CSUF, freshman John Wilson seeks assistance from Michelle Nunez. As an academic peer counselor, Nunez offers students a wide range of information — from assessment of class schedules to financial aid status to housing arrangements.

EOP Grant

An EOP Grant may be offered to eligible students in the amount of $200 to $1,000 each academic year. You may apply for the grant by using the standard financial aid application forms and procedures required by the Financial Aid Office.

How to Apply for EOP

When you apply for admission through EOP, you are required to submit additional forms and materials. This process enables EOP to select the most qualified applicants to fill the limited number of enrollment openings available each year.

Admissions Materials to Submit to the Office of Admissions and Records

Pick up a copy of the CSU system-wide application booklet and the EOP application from the Admissions or EOP offices of any CSU campus, or from your high school counselor, and submit the following:

1. Part A — the Application for Admission/Readmission.
2. $55 Application Fee or Fee Waiver Application Form.
3. High school and/or college transcripts, or GED score.
4. SAT or ACT test score.*

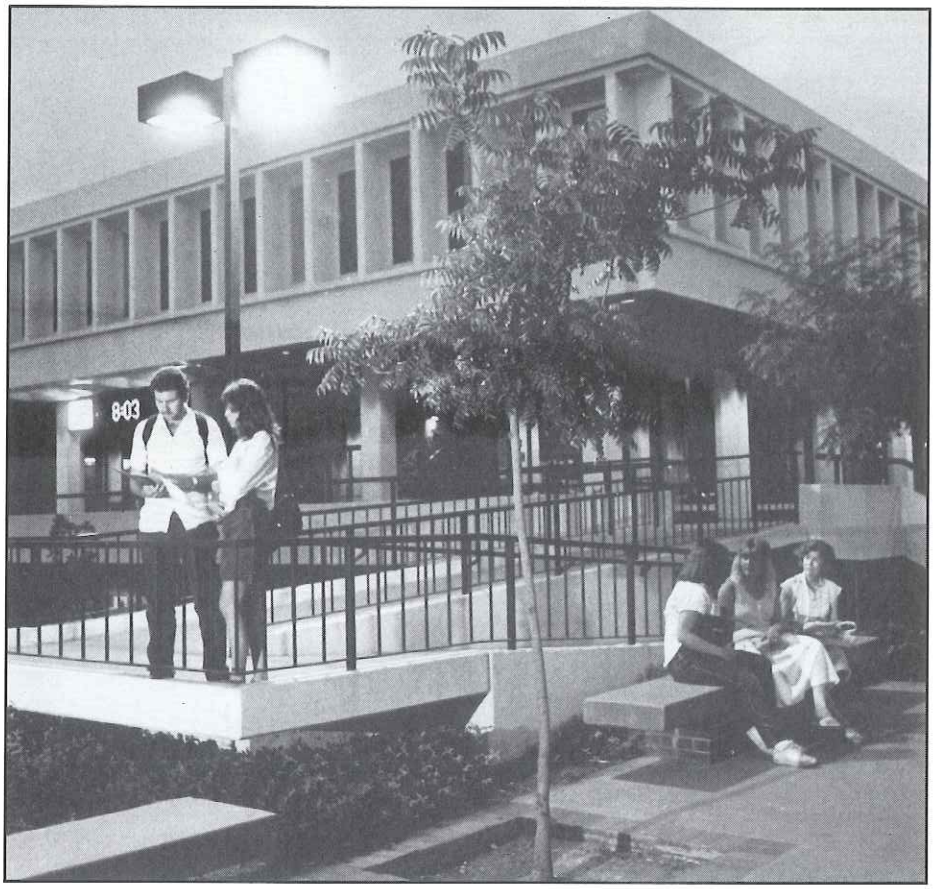
Application Materials to Submit to the EOP Office

1. Applicant Information Form.
2. Nomination Form.
3. Autobiographical Statement.
4. Recommendation Form.

* The EOP Office recommends the ACT for applicants in high school.

Extended Education

Extended Education
San Ramon 3, Room 141
(209) 278-2524
Dean, Audrey S. Anderson



The Division of Extended Education is responsible for providing adult learners with educational opportunities designed to meet their needs for career advancement, professional growth or life enrichment. CSU, Fresno is sensitive to the ever-changing demands of adult life and attempts to meet these diverse educational needs through its many offerings of credit courses, conferences, institutes and seminars.

Extension Programs

Various academic departments offer conferences, institutes, workshops, seminars and courses at several sites throughout the CSU, Fresno service area through the Division of Extended Education.

The financially self-supporting Extension program includes a variety of courses in all disciplines to meet the growing demand for continuing education. To provide flexibility and to better serve the needs of the entire community, regular university courses are offered for credit, as well as other programs for noncredit.

Open University

Open University provides an opportunity for those individuals who are not admitted to the university on a *regular status* to enroll in regular courses as an Extension student. These courses are open to anyone in the community.

Weekend University Courses

Weekend offerings are short but intensive courses designed to meet the academic needs and interests of matriculated students. Because of their brevity and intensity, the courses provide ideal conditions for academic exploration, as well as an acceptable means for meeting academic requirements. Courses are open to anyone in the community through the Open University Program.

Travel Study Programs

Travel Study Programs feature the most pleasant and rewarding methods to learn through travel and study. The instructors responsible for the program offerings design the courses to include a variety of learning activities that provide a series of enriched travel study experiences.

Noncredit Programs

Offerings in this area include specially-designed programs developed to satisfy the needs of the specific participants or organizations involved. Professional conferences, seminars, workshops and institutes are usually jointly sponsored by an academic department of the university and a professional organization, business or community agency.

Summer and Winter Programs

The university offers short-term summer session and winter session programs. A wide variety of programs are made available to regular college students, as well as others who wish to expand their general, cultural, or avocational interests and knowledge.

Visalia Center

The CSUF/COS Center has been established through a cooperative effort by California State University, Fresno and the College of the Sequoias to expand access to public higher education in the South Valley region. Regular degree courses are offered at times designed to appeal to reentry and nontraditional students who work during the day or who have difficulty commuting to Fresno.

For a catalog of current course offerings, call the Division of Extended Education, 278-2524.

Student Affairs
Student Health Services
Barton and Shaw Avenues
(209) 278-2734
Director, Robert M. Paull, M.D., M.P.H.



Working quickly and confidentially, chief pharmacist Jim Brummel and student assistant Susie Kalinian dispense medicine to students at the campus pharmacy.

Student Health Services provides outpatient clinical medical care to students enrolled in the university in accordance with policies set by the Board of Trustees of The California State University.

The Health Center is supported by a portion of the State University Fee paid by each student. These funds finance basic health care for students. In addition, each student may voluntarily pay an optional health fee that supports certain services and treatments not funded through the State University Fee.

A brochure is available at the Health Center that gives a detailed description of basic health care and additional services available through payment of the voluntary health fee or on a fee-for-service basis.

Facilities

The Health Center features well-equipped doctors' offices and examination rooms, laboratory and X-ray facilities, physical therapy, nurses' treatment rooms, a pharmacy, business office, and waiting rooms.

The Staff

The staff is here to help you reach your educational objectives and to assist you in maintaining optimum health, both physically and mentally. The staff includes full-time physicians (including specialists in family practice, internal medicine and gynecology), pharmacists, physical therapists, nurse practitioners, nurses, a nutritionist, clinical laboratory technologists and X-ray technologists. Part-time physicians (consultants) in orthopedics, dermatology, radiology and psychiatry are also available.

Appointments and Consent to Treat

You may make appointments in person or by telephone. If you are under the age of 18, we must have parental consent to treat you.

Family Planning

The Health Center provides a comprehensive family planning service that includes a complete examination, laboratory testing, pap test, birth control counseling and consultation.

Pharmacy

Prescriptions and non-prescription medicines are available for a modest fee.

Physical Therapy

This service is available if you have paid the voluntary health fee or on a fee-for-service basis.

Immunizations

The Health Center provides immunizations when clinically indicated. This includes administering allergy shots to students who have their own medication. Some charges are necessary if the voluntary health fee is not paid. Be sure to bring your immunization record with you to the Health Center.

Summer Care

You are eligible for services in the specific summer session for which you are enrolled.

Health Insurance

You may purchase an insurance protection plan for emergency illness and accidental injury during hours that the Health Center is closed. Sponsored by the Associated Students, the program provides substantial coverage for hospital benefits, medical, surgical and related services for any illness or accident. It is very important to have this type of coverage if you are no longer under your parents' insurance.

Health Education Information

If you are concerned with a health-related problem, you are encouraged to consult with the Health Center staff. They will either answer your questions or direct you to someone who can. A full-time health educator develops and coordinates the health education programs offered by Student Health Services. Health education literature is available in the Health Center and in the University Student Union.

Housing

University Housing
The Lodge
(209) 278-2345
Director, John Wetzel



Living on campus can be an important part of your educational experience. All freshmen and transfer students, as well as other students, wanting an opportunity to meet and develop friendships and wanting to participate in the academic atmosphere of the university should consider living on campus.

Residence Hall Living

The convenience of being on the campus makes going to and from class easy. It encourages the use of campus facilities, such as the library, computer and science laboratories, along with attendance at such activities as dances, plays, lectures and concerts occurring during evenings and weekends.

The halls have a variety of interesting and enjoyable programs designed to add an exciting dimension to residence hall living in addition to providing a vehicle through which students can meet other students living in the halls. Social activities include dances, special hall and floor dinners, picnics and movies.

A swimming pool and computer lab are available for exclusive use by residence hall students.

Individual Halls

The housing complex consists of nine residence halls, an administration building and the residence dining hall. Baker, Graves and Homan Halls each house 212 students in a design that encourages building unity. The other halls are generally referred to as Commons although each building is named for easy identification. Birch, Cedar and Sequoia surround the south quad, while Aspen, Ponderosa and Sycamore surround the north quad. Most of the halls are coed. Coed buildings are characterized by men living on one floor or wing and women living on another. A total of 1,200 students live on campus.

Almost all of the rooms are shared by two students, although approximately 100 single rooms are available for students wanting greater privacy.

Staff

Trained professionals are available to help make your stay in the residence halls enjoyable. Specialists in programming both develop and assist you in developing social, cultural, educational, and recreational programs and activities. Staff are also available to assist students in resolving personal problems.

Augmenting this staff are the senior resident adviser and resident adviser staffs. Students with previous residence hall living experience are selected to serve as student leaders on each floor. Their understanding of life in the residence halls is valuable in helping new and returning students adjust to residence hall living.

Resident advisers receive training in such areas as counseling and first aid and understand the workings of the university so they can assist students with academic related issues, emergencies and personal concerns. Once you have lived here, you may want to consider becoming a resident adviser. You'll find this an excellent opportunity to develop valuable leadership skills while receiving free room and board.

How to Apply

The housing application process is completely separate from the process of being admitted to the university.

Applications are available starting in March for the fall semester and in October for the spring semester. You are urged to apply early as on-campus space is limited. All students must agree to live in the halls for the entire academic year.

All individuals applying to the university for the first time automatically receive housing information. You need not wait until you are officially accepted by the university, and if you are denied admission, your deposit will be refunded to you once you notify us.

If you would like a housing application, contact the University Housing Office by calling **(209) 278-2345.**

Off-Campus Housing

Each year an apartment brochure is prepared identifying apartments within the vicinity of the campus. Our experience indicates that most students find this publication helpful in locating good, affordable housing. Listings of houses, rooms and students looking for roommates are also available at the University Housing Office.

Instructional Media Center
Library North, First Floor
and Basement
(209) 278-2674
Acting Director, Wymond Eckhardt

The Instructional Media Center (IMC) is an academic support unit of the university. Its primary mission is to support the programs of academic affairs by using its resources to improve the quality of instruction and research. Secondarily, audiovisual assistance is provided in support of administrative and student programs. Three types of services are provided by IMC.



Media, Materials and Equipment

More than 7,500 programs (16mm films, slide sets, filmstrips, audio cassette tapes, etc.) are available from the university's collection housed in IMC. In addition, resource personnel can assist in locating and gaining access to off-campus resources where additional materials are available via free loans, rentals, leases and contracts.

When there are specialized, frequent-use and difficult-to-obtain materials required for the instructional program, IMC resources and personnel are available to assist academic departments with the acquisition of these new media for inclusion in the university's collection. Audiovisual equipment and materials can be booked for instructional, research and administrative uses and will be delivered to on-campus locations if ordered at least 24 hours in advance. Equipment and materials for use in extended education and off-campus university programs are available at the IMC will-call counter.

Facilities are available where faculty, staff and students may preview materials and where media-support personnel will demonstrate the proper operation of audiovisual equipment.

Maintenance and Repair

The servicing of university audiovisual equipment and facilities is the responsibility of IMC's technical staff. These technicians are also available to consult on the design, fabrication and construction of media systems and facilities for instructional and special purpose uses.

Production

The Instructional Media Center provides four types of production services where materials are created and produced in support of the instructional, research and administrative programs of the university. Commercially-produced materials are duplicated or reproduced only in accordance with copyright laws and Congressional guidelines.

In the **graphics** area, artists create and assemble one-color to four-color, finished, camera-ready and original artwork for fliers, graphs, catalogs, displays, drawings, diagrams, transparencies, pamphlets, signs and maps.

In the **photoelectronic typesetting** facility, artists and specialists produce electronically created finished and camera-ready artwork for brochures, forms, journals, newsletters, business cards, books, slides, tables, displays and signs.

In the **photography** studio and darkrooms, the photographers produce black-and-white and color slides and prints, passport photos, studio portraits and still-life photos, duplicate slides, black-and-white halftones, title slides, line-copy duplications and copystand photos. Selected campus and off-campus assignments are accomplished. A file of campus photographs — slides and prints — is maintained.

In the **sound recording** studio and duplication facility, the production specialist can produce audiotape programs for use independently or in conjunction with other media. High-speed cassette duplication equipment makes possible the quality reproduction of audiotapes in a fast and efficient manner.

For more information about the audiovisual resources and services available, come to the **Instructional Media Center** in the **Library North** or phone **(209) 278-2674.** A professional staff of technicians, specialists, artists, photographers, and resource and administrative personnel is available to serve and support university programs.

Instructional Telecommunication Center

Instructional
Telecommunication Center
Speech Arts, Room 156
(209) 278-3066
Director, Russ A. Hart



The Instructional Telecommunication Center (ITC) provides complete radio and television production and distribution facilities, including duplication capabilities, for the enhancement of the university academic program.

The center's goal focuses on the desire to create a complementary arrangement for the implementation of media-based curriculum materials, while providing support for the institution in the pursuit of its educational duties.

In conjunction with the Telecommunications Department, students develop practical production skills, thanks to the hands-on laboratory experiences offered within ITC's facilities. Under the supervision of faculty and professional staff, students produce a variety of materials for extra-departmental classroom instruction and the university's community service activities. Depending upon their interest and aptitude, students may participate in any of the following services typically provided by educational, corporate and governmental telecommunication centers.

Program Acquisitions

Appropriate materials required for instructional support may be acquired from a variety of sources. Programs may be leased or purchased from educational producers, as well as recorded off the air from commercial or public television stations and satellite operations, in accordance with copyright laws and Congressional guidelines.

Program Production

Materials that cannot be acquired from existing sources are designed and developed utilizing studio and location resources. Programs produced internally are viewed in classes, on local cable channels and on broadcast television. Several rooms are also equipped with television camera-recorder units for faculty to record instructional experiences, such as student-teaching, student-nurse encounters with patients, faculty self-evaluations, role-modeling, interviewing skills and speech presentations.

Distance Education

Beginning in the fall of 1987, selected classes originating on the CSU, Fresno campus have been broadcast live on an Instructional Television Fixed Services (ITFS) channel to various sites throughout the San Joaquin Valley. Students at the receiving locations watch the ITFS broadcasts and interact with the CSU, Fresno campus class via telephone hookup.

Videotape Library

An ever-increasing videotape library of more than 2,000 titles, spanning many disciplines, is maintained by ITC for faculty, staff and student use. Sources of these materials include the locally and commercially produced programming previously mentioned. Major topics include: agriculture, anthropology, art, business, child abuse, communication, computers, crime and criminals, economics, engineering and industrial arts, ethnology, history, land use planning, medical sciences, military science, nutrition, performing arts, philosophy, physical education, political science, psychology, natural and physical sciences, social service, sociology and women's studies.

Distribution

Color television monitors and videocassette recorders (VCRs) featuring a variety of standard formats — including ¾-inch U-matic, ½-inch Beta and VHS, and ½-inch reel-to-reel — are available for delivery to classrooms throughout the university. A closed-circuit television system also provides for program delivery to selected campus facilities.

Technical Support

ITC also provides an in-house repair service for all television equipment located on campus. In addition, the engineering staff offers consultation to academic departments on system design for special micro-teaching and research applications.

For more information regarding services offered by the Instructional Telecommunication Center, contact the professional staff, Speech Arts, Room 156, **(209) 278-3066.**

International Student Services and Programs

Student Affairs
International Student Services and Programs
International Admissions
Southeast Asian Student Services
International Programs — Study Abroad

Joyal Administration, Room 211
(209) 278-2782
Telex 9102503250
FAX (209) 278-7044
Director, Carol B. Munshower



Where's your homeland? That was the question of the day for (from left) counselor John Fu and students Isha Edgley and Abeezar Poonawawa.

California State University, Fresno, welcomes you as an international student, permanent resident, or immigrant student and provides a comfortable environment that allows you to make the most of your educational experience.

CSU, Fresno attracts international students from more than 70 countries and has one of the largest international student populations in the CSU system, numbering more than 1,000. The university also enrolls more than 1,000 immigrant and permanent-resident students.

The university employs international and multiethnic faculty and staff, many of whom work with you directly to assist you in attaining your educational goals and making the critical personal and cultural adjustments necessary for success.

The International Student Services and Programs Office is primarily responsible for assisting you. Being an international staff ourselves, we understand your goals, ambitions, home country and family expectations.

We process your application for admission and evaluate your courses for transfer credit. Upon admission, international students receive information regarding arrival in the United States, visa and immigration, housing in the Fresno area and registration. After arrival, the staff guides you through several mandatory preregistration workshops, postadmission English testing and registration. You may be enrolled in English as a Foreign Language courses your first semester. (See *International Programs — Special Programs* section.) Some of the other opportunities available to you include the following:

Help with housing is available. An American family or a student from your country can meet you at the airport when you first arrive and provide some short-stay emergency housing. The International staff is available to assist you in obtaining housing.

Learn about Americans by making friends with families through our International Friendship Program.

Enjoy recreational activities with fellow classmates by participation in trips and activities.

Take advantage of opportunities to share your country and culture with the Fresno community and CSU, Fresno campus by speaking to small groups through our International Speaker's Program.

Keep in touch with all the happenings through the monthly *International Newsletter,* written by the International staff with contributions from fellow international students and faculty.

Join the many international clubs or any of the 200 other organizations available on campus. Participate in and enjoy the varied cultural programs during the year such as International Week, U.N. Celebration, International Night, Mooncake Festival, Malaysia Night and other national day celebrations.

Learn about travel and study overseas by using our resource library and talking to the International Programs Campus Coordinator. (See *International Programs: Overseas — Special Programs* section.)

The International counselors take a personal interest in helping you get adjusted to the academic requirements of the university, as well as your own personal concerns, such as financial problems, immigration matters, counseling and personal problem solving. Agency and foreign government sponsored students participate in our Sponsored Student Program.

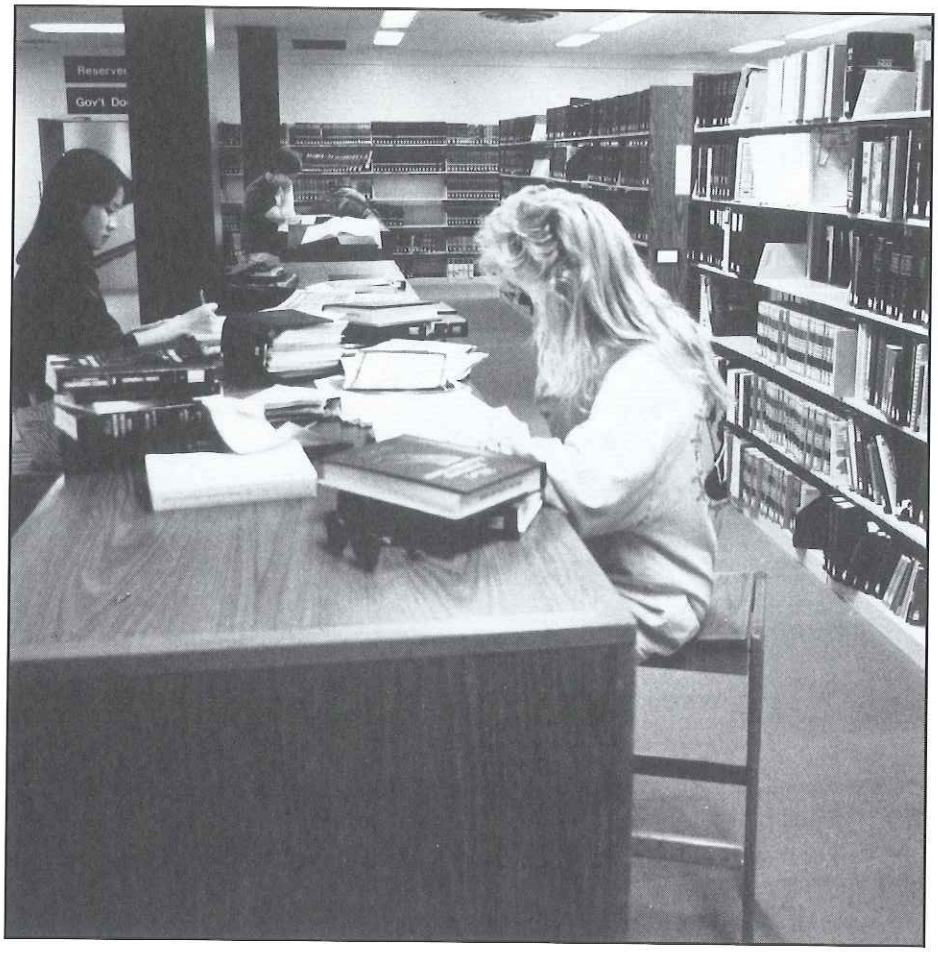
Southeast Asian students obtain services to meet their special needs as permanent residents in the United States. **Southeast Asian Student Services** provides academic advising, personal counseling and support for academic success.

CSU, Fresno offers you more than good weather, a reasonable cost of living, and excellent selections in undergraduate and graduate academic programs. We care about your development as a whole person; that your stay and learning in the United States be worthwhile. We believe your experience and involvement in the United States will enrich your life, as well as our university. We look forward to sharing this experience with you.

Library Services

Henry Madden Library
Hours of Opening: 278-2596
Circulation Dept.: 278-2551
Reference Questions: 278-2174
Dean of Library Services, Michael Gorman

The Henry Madden Library is a center for study, reading and scholarship at CSU, Fresno. Its collections and services are basic resources supporting the undergraduate and graduate instructional programs. In the fall of 1980, a $5.8 million expansion and remodeling project increased student seating capacity to 2,000 study stations.



Collections

Books and Bound Periodicals. More than 800,000 volumes on virtually every subject imaginable are available for use. This diverse and growing collection will meet your research needs throughout your university career.

Periodical Subscriptions. The library subscribes to more than 4,000 periodicals from all over the world. The Kardex, a complete and up-to-date listing, tells you which journals the library owns.

Government Documents. Publications of the federal government and the state of California provide a wealth of useful information. Selected publications of foreign governments and international organizations are also received. The Government Documents Department houses more than 260,000 documents.

Specialized Collections. Rare books, materials on local history, curriculum materials, juvenile literature, 120,000 sheet maps, and 78,000 music scores and recordings provide enrichment and specialized resources for students and faculty alike. Each of these collections is a model of its kind.

Services

Learning about the Library. Numerous programs are available each semester to help you learn to use the services and collections of the library. A self-guided tour is available whenever the library is open.

Professional Assistance. A member of the library faculty is available to help you in the Reference Department during most hours the library is open. Specialized professional assistance is also available in other departments.

Easy Check Out. A computer system makes checking out a book simple and fast.

Copies. Photocopy machines are available throughout the library. A card metering system allows you to make copies without the bother of using coins. Prints can also be made from microfilm and microfiche.

Computerized Research. A CD-ROM system enables you to perform your own searches in selected subject areas. A fee-based, online service allows you to work with a librarian to access a wider range of data bases. These services are available in the Reference Department.

Multicultural Center. The center provides a "gateway" to the resources and services of the library for minority students and others interested in minority studies. The center is a focal point for assistance in using the library's resources and referral to the various services offered by the library.

Interlibrary Loan. The Interlibrary Borrowing Service allows you to obtain research materials that are not available locally.

Resource Center for Students with Disabilities. Special services, including listening and recording booths, braille reference books and reading machines for the visually impaired are available here.

Typing. Typewriters and word processors are available for rent in the library.

Reentry Program

Student Affairs
Reentry Program
Main Cafeteria West
(209) 278-3046
Director, Arlene L. Bireline

It is time that we had uncommon schools, that we did not leave off our education when we begin to be men and women.
— Thoreau, Walden

Education is the key to a better life and a more secure future. The Reentry Program assists potential students, 25 years of age and older, who wish to begin or resume a college education. Transitions are difficult for people of all ages — changes in routines, adjustments to new relationships and surroundings.

The Reentry staff has a special interest in fulfilling the changing needs of adult learners. Though many who have been away from the formal learning process are apprehensive, we find that the success rate among returning students is high.

Adults possess certain assets that come only with age and experience. Older students tend to have strong motivations, coupled with a special eagerness to learn. Wider life experiences usually mean more effective coping skills. Staff and peer advisers help the reentry student to make the best use of these advantages.

At the same time, returning individuals are often faced with complicated circumstances which, while making further education desirable, also make it difficult to achieve. Our Reentry staff can help when complex issues need attention. Services offered by the Reentry Program include the following:

Pre-entry advising to help you with your initial questions about college. We can advise you regarding eligibility, courses, costs, deadlines and services available.

Academic advising to give you the information you need to make informed decisions about your academic career.

A.V. Lending Library provides VCR tapes (both VHS and Beta) on a variety of helpful topics for student use.



Walking around campus is easy now for Bill Ellis and Paulette Murray (left). Here, they stroll the familiar walkway with Reentry counselor Angie Cisneros. After a 26-year absence from the formal learning process, Ellis admits that the first step is the hardest but adds, "Thanks to the university's Reentry Program, it's not so bad."

Crisis and personal counseling to assist with the transition to student life.

Evening Program provides support services for reentry students with evening classes.

Peer support for reassurance and building a feeling of belonging to the campus community. A student lounge in the Reentry Center provides a place for reentry students to meet friends or relax between classes.

Weekly support groups, including a brown-bag lunch meeting, to provide emotional support and an opportunity for students to share concerns with other reentry students.

Coffee hours scheduled weekly to provide informal information sessions for reentry students. Excellent speakers from the campus and community address a variety of interesting topics, such as time management, stress control, overcoming academic anxiety, etc.

Career exploration and counseling to assist the older student in making well-informed, appropriate decisions when change is needed.

Workshops offered in the evenings and on weekends to further assist reentry students with self-awareness, personal growth, relationship and family enrichment, and academic success.

Referrals to campus services such as Career Development and Employment Services, Counseling Center, Child Care Center and Financial Aid.

If you would like more information about the many opportunities for reentry students, we invite you to telephone **278-3046** or visit the Reentry Office.

Students for Community Service

Students for Community Service
San Ramon 3, Room 111
(209) 278-7128
Coordinator, Frank E. Padilla



If you feel that working in a museum, experiencing the exciting world of public broadcasting, tutoring adults or making friends with someone who needs a friend is something you want to do, then Students for Community Service can help.

In 1986, the California Legislature passed Assembly Bill 1820. The bill, signed by the governor, contains provisions for the establishment of a Human Corps (a.k.a. Students for Community Service) involving college students for the following purposes:

- Providing college students with real-world learning opportunities.
- Fostering a sense of social responsibility and "community" among students.
- Stimulating cooperation and coordination between institutions of higher learning and traditional agencies responsible for the delivery of volunteer efforts and community services.
- Substantially increasing the community service participation of college students so that all full-time college students will provide an average of 30 hours of community service each academic year.

Who Volunteers?

- A person who enjoys the rewards of helping someone in need.
- A person concerned with social needs.
- A person who would like to experience real-life situations to help them decide what career path to pursue after college.
- A person who would like to sharpen their people skills by working with others.

Who Thinks Volunteer Work is Important?

The following quotes are from a few corporate chief executive officers who were asked how they perceive those who volunteer to perform community service:

"To maintain the vitality of our nation and develop future leaders, we must complement higher education with a commitment to the welfare of others."

—Riley P. Bechtel, President, Bechtel Group

"I have long believed that it is important to evaluate prospective associates against the criteria of whether their attitude was a focus on the person 'I' or the person 'you.' One of the finest demonstrations of someone who is genuinely capable of putting others ahead of themselves is civic and social service."

—Robert W. Galvin, Chairman, Motorola

"A record of community service in an applicant's resume demonstrates conscientiousness, an ability to work well with others and a sense of social responsibility. It is important to know that prospective employees have the interests of others in mind as well as their own."

—Russell R. Mack Jr., Vice President, United Airlines

Who Benefits?

Everyone! The staff and programs of nonprofit agencies have suffered budgetary cutbacks, yet client needs have continued to expand. As a volunteer you receive positive reinforcement and experience. Knowledge gained as a volunteer does not end upon graduation. Your employer will note that you are a doer. Your community will recognize a socially concerned citizen. In these ways, both you and the community gain.

Also, you can receive 1–3 units of credit if you successfully complete the following course: Community Service 101, Students for Community Service.

If you would like more information about the many opportunities to volunteer with established local nonprofit organizations, contact us at 278-7128 or visit SR 3, Room 111.

Student Affairs
Office of Testing Services
1700 E. Bullard (Northwest corner of Cedar and Bullard)
(209) 278-2457
Director, J. Richard Arndt

Taking a test may not be your favorite way to pass the time away, but test taking is very much a part of student life on a university campus. Many students take tests to "get in," others take tests to "get out."

It is the overall goal of the Office of Testing Services to effectively and accurately measure your academic aptitudes and personal attributes as required or deemed desirable by the California State University system regulations, faculty, and your own personal needs and interests.

Our professional staff includes a test officer and a psychometrist who have educational backgrounds and experience emphasizing measurement of student growth and development, program assessment and evaluation, educational research and computer applications related to the aforementioned activities.

Personal and Career Assessment

Several instruments designed to measure vocational career interests, aptitude and achievement, and personality characteristics are administered on a referral basis only. Inventories may be requested through a counselor in the Counseling Center if you have personal concerns or a counselor in the Career Development and Employment Services Office if you are interested in career assessment.

Undergraduate Entrance Examinations

Your application for admission to CSU, Fresno may require scores from the SAT or ACT. While most students take the SAT or ACT on regular national testing dates, the office will provide assistance to students who need to make alternative arrangements. For international students seeking university admittance, special dates for the Test of English as a Foreign Language (TOEFL) are offered.



Required Tests

Testing Services has information about tests you may be *required* to take, such as the CSU English Placement Test (EPT), the Entry Level Mathematics Test (ELM) and the Upper Division Writing Examination (UDWE).

Graduate School Testing

This office also handles the administration of many tests given nationwide, such as the Graduate Record Examination (GRE), Law School Admission Test (LSAT), Medical College Admission Test (MCAT), the Test of English as a Foreign Language (TOEFL), the Graduate Management Admission Test (GMAT), the National Teacher's Examination (NTE) and others. The California Basic Educational Skills Test (CBEST) is also administered on this campus.

Test Scoring

An instructional test scoring service aids faculty in the development, scoring, analysis and electronic grade management for objective tests used in the classroom.

Consultative Services

Within the limits of available time, the staff provides assistance to students, faculty or other university departments in the areas of test development and analysis, research design, statistical analysis, test evaluation and computer applications related to the aforementioned activities.

For more information about tests and services, stop by the Office of Testing Services and ask the people who work with tests the most — William P. Stock, test officer; Phyllis Redfield, psychometrist; Ramiro U. Estalilla Jr., secretary.

University Outreach Services

Student Affairs
Office of University Outreach Services
Joyal Administration, Room 251
(209) 278-2048
Director, Frances A. Peña



The Office of University Outreach Services (UOS) was established to coordinate all of CSU, Fresno's ongoing outreach activities including Student Affirmative Action and Extended Outreach.

The primary focus of UOS is to assist students with preadmission procedures necessary to attend CSU, Fresno, to improve access for students from underrepresented populations, and to develop and maintain a viable relationship with all segments of the community for a better understanding of the university and its services.

As a regional university, CSU, Fresno concentrates its major outreach activities in high schools and community colleges in the CSUF service area which consists of a four-county region: Fresno, Madera, Tulare and Kings. UOS also provides outreach services to extended areas adjacent to our service region. The following are some of the services provided by UOS:

Service Area High School Outreach

Schools serviced by University Outreach are visited once during the fall semester with a follow-up visit in the spring. Information on admissions, financial aid, scholarships, housing and academic majors is provided in small or large group settings. In most cases, a separate presentation is given to potential Educational Opportunity Program (EOP) students during the school visit.

Transfer Services

Community colleges in our service area receive regular visits by outreach staff, and most students are seen by appointment. Community colleges in our service area receive weekly visits by outreach staff, and most students are seen by appointment. Most colleges in the central valley and central coast receive regular visits. Consult with your Transfer Center or Counseling Center. University Outreach Services also participates in the Fresno City College Transfer Center Project. The Transfer Center sponsors several activities to promote and increase the number of transfer students.

Student Affirmative Action

Student Affirmative Action provides "placement" services to high schools with high minority enrollments. Schools selected as placement sites are visited weekly or biweekly by Peer Outreach Representatives to assist prospective seniors.

The Early University Outreach component encourages, motivates and exposes underrepresented students to higher education as early as the seventh grade. Services provided to students include school site visits, enrichment workshops, university classroom experience, campus tours, advising, parent meetings and home visits.

Student Intern-Outreach to Underrepresented Students

University student interns encourage and motivate primarily ninth and tenth graders to enroll in college preparatory courses that will lead to CSUF admissions. Seventeen high schools are in the program.

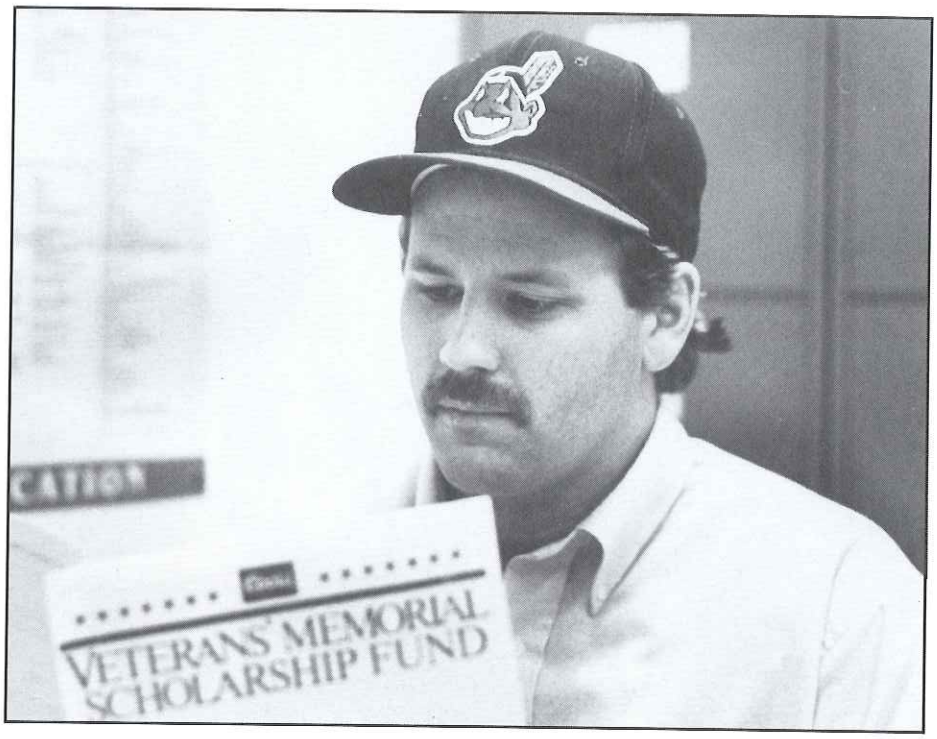
Extended Outreach Services

This program provides central locations for residents of West Fresno and Madera to obtain information about the university regarding admissions applications, financial aid and academic programming. Extended Outreach also focuses on providing extended outreach to West Fresno elementary schools.

Veterans Affairs

Student Affairs
Office of Veterans Affairs
Joyal Administration, Room 240
(209) 278-2562
Director, Ernest G. Shelton

The Office of Veterans Affairs (OVA) at CSU, Fresno is a federally funded program that provides a variety of services to veterans. The OVA is your liaison with the Veterans Administration and the State Department of Veterans Affairs, and other related agencies for the veteran population of the campus.



Eligibility

Most veterans who are honorably discharged are eligible for educational benefits if they have served a minimum of 181 days of active duty after January 31, 1955, but before January 1, 1977. Veterans transferring to CSU, Fresno from other institutions are strongly urged to contact the OVA and file a request for a Change of Place Training (VA 22-1995) at least two months prior to the beginning of the semester. Students who have never used the G.I. Bill should also apply through the OVA at least eight weeks in advance. All enrollments must be certified by the Veterans Administration before any benefit checks are issued.

Veterans are not the only students eligible for G.I. benefits. Dependents of deceased or disabled veterans, and certain dependents of California veterans may qualify for benefits. Eligibility is established on a case-by-case basis. Contact the OVA for detailed information and assistance in establishing your claims.

How to Apply for Benefits

You may contact the Office of Veterans Affairs by telephone, letter, or better yet, in person. The staff will give you all the necessary application forms. The educational assistance programs for which you may apply are:

G.I. Bill Educational Training for veterans of the post-Korean Conflict period and Vietnam Era and service personnel.

Contributory Educational Assistance Program for veterans and service persons entering active duty on or after January 1, 1977.

Vocational Rehabilitation for disabled veterans of World War II, the Korean Conflict, the post-Korean Conflict, the Vietnam Era and certain peacetime veterans.

Survivors and Dependents Education for children, spouses, survivors of veterans whose deaths or permanent total disabilities were service-connected, and for spouses and children of service persons missing in action or prisoners of war.

Chapter 106

Educational Assistance for members of the Selected Reserve, effective July 1, 1985; Chapter 106, Educational Assistance for members of the Selected Reserve is also referred to as the Selected Reserve Educational Assistance Program. Contact the campus Veterans Office for more information.

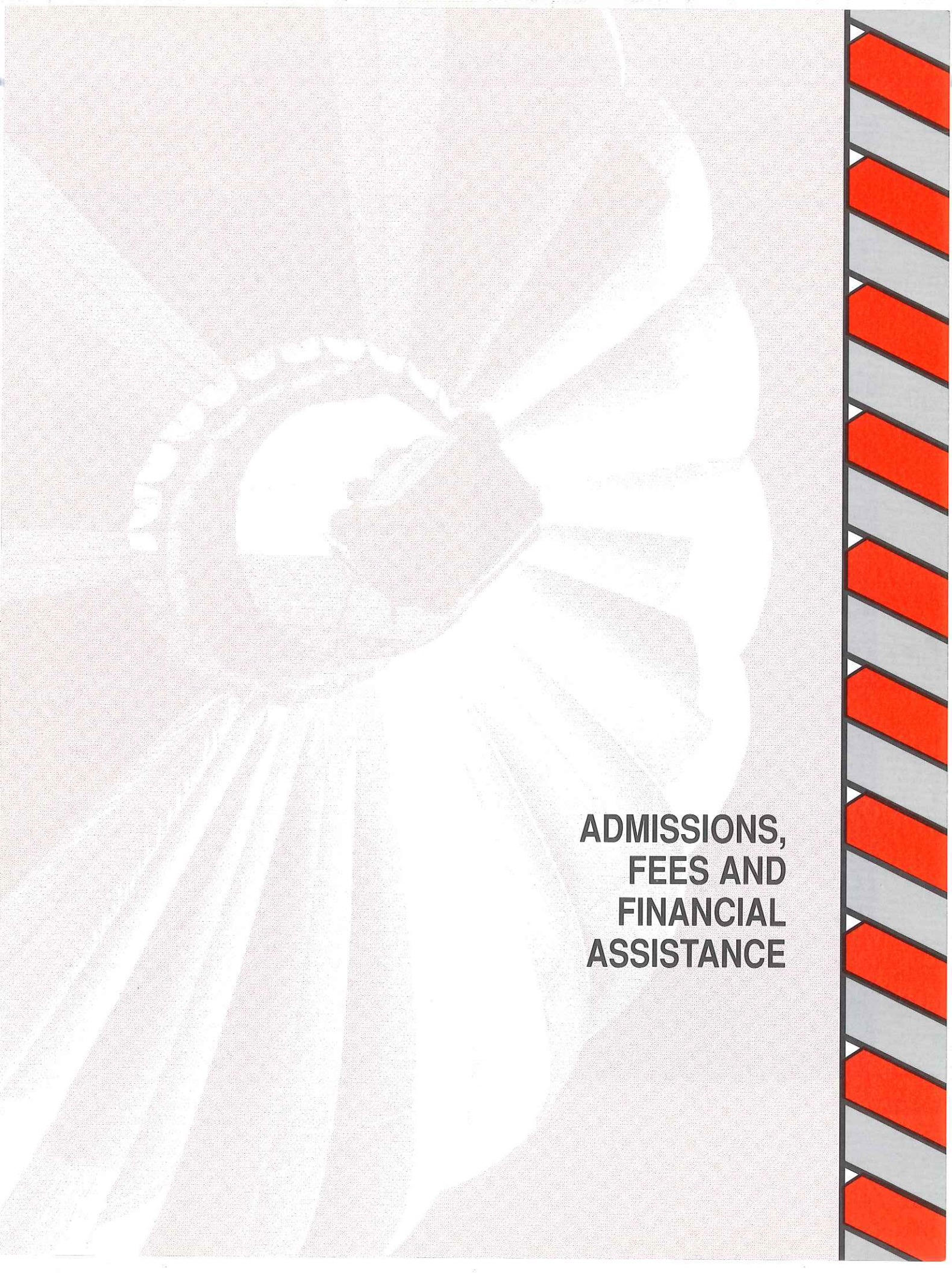
Chapter 30

A new G.I. Bill, known as the Veteran's Educational Assistance Act of 1984 (Montgomery G.I. Bill) is geared toward new recruits, who enlisted after June 30, 1985, and members of the military who enlisted prior to January 1, 1977, and who have continuous service. Additional information is available in the Veterans Office.

Services Provided by the Office of Veterans Affairs

- Processing veterans application for educational benefits.
- Processing and forwarding certification forms.
- Processing application for advance pay.
- Processing enrollment status, i.e., dropping of units, changing of majors, withdrawals, etc.
- Processing tutorial forms.
- Processing of fee waivers.
- Inquiries.
- Academic advising.
- Personal counseling.
- Work-Study Program.


THAILAND
CAMBODIA
VIETNAM



ADMISSIONS, FEES AND FINANCIAL ASSISTANCE

Admission Requirements and Registration Process

Admissions Office
Joyal Administration Lobby
(209) 278-2261
Director, Richard L. Backer

Requirements for admission to California State University, Fresno are in accordance with Title 5, Chapter 1, Subchapter 3, of the *California Code of Regulations*. If you are not sure of these requirements you should consult a high school or community college counselor or the Admissions Office. Applications may be obtained from the Admissions Office at any of the campuses of The California State University or at any California high school or community college.



Importance of Filing Complete, Accurate and Authentic Application for Admission Documents. The CSU advises prospective students that they must supply complete and accurate information on the application for admission, residence questionnaire and financial aid forms. Further, applicants must submit authentic and official transcripts of all previous academic work attempted. Failure to file complete, accurate and authentic application documents may result in denial of admission, cancellation of academic credit, suspension or expulsion (Section 41301, Article 1.1, Title 5, *California Code of Regulations*).

Applicants are required to include their Social Security number in designated places on applications for admission pursuant to the authority contained in Title 5, *California Code of Regulations,* Section 41201. The Social Security number is used as a means of identifying records pertaining to the student, identifying the student for purposes of financial aid eligibility and disbursement, and the repayment of financial aid and other debts payable to the institution.

Undergraduate Application Procedures

Prospective students, applying for part-time or full-time programs of study, in day or evening classes, must file a complete application as described in the admissions booklet. The $55 nonrefundable application fee should be in the form of a check or money order payable to The California State University and may not be transferred or used to apply to another term. Applicants need file only at their first choice campus. An alternative choice campus and major may be indicated on the application, but *applicants should list as an alternative campus only that campus of The California State University that they can attend.* Generally, an alternative major will be considered at the first choice campus before an application is redirected to an alternative choice campus. Applicants will be considered automatically at the alternative choice campus if the first choice campus cannot accommodate them.

For undergraduate admission to CSU, Fresno a student must:

1. Submit a current application with a nonrefundable application fee to the Admissions Office.
2. Request institutions formerly attended to send directly to the Admissions Office transcripts of credits from high school and colleges. College transcripts are required in duplicate. Failure to include all colleges attended may result in cancellation of the student's registration. All transcripts submitted by students are retained by CSU, Fresno.
3. If a lower-division applicant, take the Scholastic Aptitude Test (SAT) or American College Test (ACT) and request official scores be sent to CSU, Fresno. The Test of English as a Foreign Language (TOEFL) is required of all foreign applicants and applicants who do not have at least three years of schooling, at the secondary level or beyond, where English is the principal language of instruction.
4. Take any additional proficiency or placement tests required.

In addition to the other documents required, a veteran should file a copy of the *Notice of Separation* (DD 214) from the armed services with the Application for Admission. Academic credit will be awarded for service time and service schools

completed as recommended by *A Guide to the Evaluation of Educational Experiences in the Armed Services.* Veterans who are California residents may be exempt from certain admission requirements. Special admission may be granted if the applicant is judged likely to succeed academically. Standard admission procedures should be followed.

Applications will not be accepted after admissions categories have closed. Eligibility for admission cannot be determined until *all* required documents have been received. Due to staff limitations, an evaluation of transfer credit will generally not be available until sometime during the first semester's enrollment.

Degree credit may be granted for work completed satisfactorily in another accredited collegiate institution, subject to the restrictions imposed on work taken at this institution. Questions concerning acceptability of a course from another institution should be addressed to the Evaluations Office.

A maximum of 70 semester units of credit is allowed toward the bachelor's degree for work completed in a community college. Community college credit in excess of 70 units may be used to satisfy subject requirements. However, no upper-division credit will be given.

A maximum of 12 semester units will be allowed for agricultural projects, work experience, and/or internship courses. No more than 6 semester units taken prior to junior standing will be accepted toward the degree. Remedial course units are not accepted for degree credit. For limitations on extension and correspondence credit, see *Extension Classes.*

Students desiring university housing or financial aid should file special applications with the appropriate offices concerned as soon as possible.

Impacted Programs

The CSU designates programs to be impacted when more applications are received in the first month of the filing period than the spaces available. Some programs are impacted at every campus where they are offered; others are impacted at some campuses, but not all. You must meet supplementary admissions criteria if applying to an impacted program.

The CSU announces before the opening of the fall filing period which programs are impacted and the supplementary criteria campuses use. That announcement is published in the *CSU School and College Review*, distributed to high school and college counselors. We also give information about the supplementary criteria to program applicants.

You must file your application for admission to an impacted program during the first month of the filing period. Further, if you wish to be considered in impacted programs at two or more campuses, you must file an application to each. Nonresident applicants are rarely admitted to impacted programs.

Supplementary Admission Criteria. Each campus with impacted programs uses supplementary admission criteria in screening applicants. Supplementary criteria may include ranking on the freshman eligibility index, the overall transfer grade point average and a combination of campus-developed criteria. If you are required to submit scores on either the SAT or the ACT, you should take the test no later than December if applying for fall admission.

The supplementary admission criteria used by the individual campuses to screen applicants appear periodically in the *CSU School and College Review* and are sent by the campuses to all applicants seeking admission to an impacted program.

Unlike unaccommodated applicants to locally impacted programs who may be redirected to another campus in the same major, unaccommodated applicants to systemwide impacted programs may not be redirected in the same major but may choose an alternative major either at the first choice campus or another campus.

Graduate and Postbaccalaureate Application Procedures

All graduate and postbaccalaureate applicants (e.g., master's degree applicants, those seeking credentials, and those interested in taking courses for personal or professional growth) must file a complete application as described in the admissions booklet. Applicants who completed undergraduate degree requirements and graduated the preceding term are also required to complete and submit an application and a nonrefundable application fee. Since applicants for postbaccalaureate programs may be limited to the choice of a single campus on each application, redirection to alternative campuses or later changes of campus choice will be minimal. To be assured of initial consideration by more than one campus, it will be necessary for any applicant to submit separate applications (including fees) to each. Applications may be obtained from the Graduate Studies Office of any California State University campus in addition to the sources noted for undergraduate applicants.

Graduate applicants are encouraged to submit applications during the initial filing period (November for fall admission; August for spring). For additional information, see the *Division of Graduate Studies and Research.*

Application Filing Periods

Each campus accepts applications until capacities are reached. Many campuses accept applications up to a month prior to the opening day of the term. Some campuses will close individual programs earlier.

- Applications for the fall semester are accepted beginning November 1. Student notification begins in December.
- Applications for the spring semester are accepted beginning August 1. Student notification begins in September.

All applications postmarked or received during the initial filing period will be given equal consideration within established enrollment categories and quotas. There is no advantage in filing before the initial filing period. Applications received before the initial filing period may be returned, causing a delay in processing. With the exception of the impacted undergraduate program areas, applications will be accepted well into the extended filing periods until quotas are filled.

Application Acknowledgment. You may expect to receive an acknowledgment of your application from your first choice campus within two to four weeks of filing the application. A notice that space has been reserved for you will also include a request that you submit the records necessary for the campus to evaluate your qualifications. You may be assured of admission if the evaluation of your qualifications indicates that you meet admission requirements. Such a notice is not transferable to another term or to another campus.

Hardship Petitions. The campus has established procedures for considering qualified applicants who would be faced with extreme hardship if not admitted. Petitioners should write the Admissions Office regarding specific policies governing hardship admission.

Eligibility Index Table for California High School Graduates or Residents of California

GPA	ACT Score	SAT Score	GPA	ACT Score	SAT Score	GPA	ACT Score	SAT Score	GPA	ACT Score	SAT Score	GPA	ACT Score	SAT Score
3.00 and above qualifies with any score			2.79	14	570	2.58	18	740	2.37	22	910	2.16	27	1080
2.99	10	410	2.78	14	580	2.57	18	750	2.36	23	920	2.15	27	1080
2.98	10	420	2.77	14	590	2.56	19	760	2.35	23	920	2.14	27	1090
2.97	10	430	2.76	15	600	2.55	19	760	2.34	23	930	2.13	27	1100
2.96	11	440	2.75	15	600	2.54	19	770	2.33	23	940	2.12	27	1110
2.95	11	440	2.74	15	610	2.53	19	780	2.32	23	950	2.11	28	1120
2.94	11	450	2.73	15	620	2.52	19	790	2.31	24	960	2.10	28	1120
2.93	11	460	2.72	15	630	2.51	20	800	2.30	24	960	2.09	28	1130
2.92	11	470	2.71	16	640	2.50	20	800	2.29	24	970	2.08	28	1140
2.91	12	480	2.70	16	640	2.49	20	810	2.28	24	980	2.07	28	1150
2.90	12	480	2.69	16	650	2.48	20	820	2.27	24	990	2.06	29	1160
2.89	12	490	2.68	16	660	2.47	20	830	2.26	25	1000	2.05	29	1160
2.88	12	500	2.67	16	670	2.46	21	840	2.25	25	1000	2.04	29	1170
2.87	12	510	2.66	17	680	2.45	21	840	2.24	25	1010	2.03	29	1180
2.86	13	520	2.65	17	680	2.44	21	850	2.23	25	1020	2.02	29	1190
2.85	13	520	2.64	17	690	2.43	21	860	2.22	25	1030	2.01	30	1200
2.84	13	530	2.63	17	700	2.42	21	870	2.21	26	1040	2.00	30	1200
2.83	13	540	2.62	17	710	2.41	22	880	2.20	26	1040			
2.82	13	550	2.61	18	720	2.40	22	880	2.19	26	1050	**Below 2.00 does not qualify for regular admission**		
2.81	14	560	2.60	18	720	2.39	22	890	2.18	26	1060			
2.80	14	560	2.59	18	730	2.38	22	900	2.17	26	1070			

Undergraduate Admission Requirements

Freshman Requirements. You qualify for regular admission as a first-time freshman if you are a high school graduate, have a qualifiable eligibility index (see table) and have completed with grades of *C* or better the courses in the comprehensive pattern of college preparatory subject requirements (see *Subject Requirements* and *Phase-in of the Subject Requirements*). Courses must be completed prior to the first enrollment in The California State University.

Eligibility Index. The eligibility index is the combination of your high school grade point average and your score on either the Scholastic Aptitude Test (SAT) or the American College Test (ACT). For this purpose we compute your grade point average on your final three years of high school studies, excluding physical education and military science, and use bonus points for approved honors courses (see *Honors Courses)*. CSU may offer you early, provisional admission based on work completed through the junior year of high school and planned for your senior year.

You can calculate the index by multiplying your grade point average by 800 and adding your total score on the SAT. Or, if you took the ACT, multiply your grade point average by 200 and add 10 times the composite score from the ACT. If you are a California high school graduate or a legal resident of California for tuition purposes, you need a minimum index of 2800 using the SAT or 694 using the ACT; the eligibility index table above illustrates several combinations of test scores and averages required. If you neither graduated from a California high school nor are a legal resident of California for tuition purposes, you need a minimum index of 3402 (SAT) or 842 (ACT).

Applicants with grade point averages of 3.0 or above (3.6 for nonresidents) are exempt from the test requirement.

You qualify for regular admission when the university verifies that you have a qualifiable eligibility index and will have completed the comprehensive pattern of college preparatory subjects and, if applying to an impacted program, meet supplementary criteria. You still qualify for regular admission, on condition, if you are otherwise eligible, but are missing a limited number of the required subjects (see *Phase-in of the Subject Requirements)*. "Conditional admission" is an alternative means to establish eligibility for regular admission. Please consult a counselor if you have any questions.

Graduates of secondary schools in foreign countries must be judged to have academic preparation and abilities equivalent to applicants eligible under this section.

Subject Requirements. The California State University requires that first-time freshman applicants complete, with grades of *C* or better, a comprehensive pattern of college preparatory study totaling 15 units. A "unit" is one year of study in high school.

- 4 years of English.
- 3 years of mathematics (algebra, geometry and intermediate algebra).
- 1 year of U.S. history or U.S. history and government.
- 1 year of laboratory science (biology, chemistry, physics or other acceptable laboratory science).
- 2 years of the same foreign language (subject to waiver for applicants demonstrating equivalent competence).
- 1 year in the visual and performing arts (art, dance, drama/theater, or music).
- 3 years of electives selected from English, advanced mathematics, social science, history, laboratory science, agriculture, foreign language, and the visual and performing arts.

Phase-in of the Subject Requirements. CSU is phasing in the freshman subject requirements and during the phase-in period admits, on condition, applicants who meet all other admission requirements but are missing a limited number of the required subjects. Students admitted on condition must make up missing subjects after enrolling in the CSU.

The phase-in schedule is:

Fall 1990–Summer 1991. At least 12 of the required 15 units, including at least 3 of the units required in English and 2 of the units required in mathematics.

Fall 1991–Summer 1992. At least 13 of the required 15 units, including at least 3 of the units required in English and 2 of the units required in mathematics.

Fall 1992 and later. Full implementation of the 15-unit requirement expected.

Waiver of Foreign Language Subject Requirement. The foreign language subject requirement may be waived for applicants who demonstrate competence in a language other than English equivalent to or higher than expected of students who complete two years of foreign language study. Consult with your school counselor or any CSU campus Admissions or Relations with Schools offices for further information.

Subject Requirement Substitution for Students with Disabilities. Disabled student applicants are strongly encouraged to complete college preparatory course requirements if at all possible. If an applicant is judged unable to fulfill a specific course requirement because of his or her disability, alternative college preparatory courses may be substituted for specific subject requirements. Students who are deaf and hearing impaired, have learning disabilities, or are blind and visually impaired, may in certain circumstances qualify for substitutions for the foreign language, mathematics and laboratory science subject requirements. Substitutions may be authorized on an individual basis after review and recommendation by the applicant's academic adviser or guidance counselor in consultation with the director of a CSU disabled student services program. Although the distribution may be slightly different from the course pattern required of other students, students qualifying for substitutions will still be held for 15 units of college preparatory study. Students should be aware that course substitutions may limit later enrollment in certain majors, particularly those involving mathematics. For further information and substitution forms, please call the director of disabled student services at your nearest CSU campus.

High School Students. Students still enrolled in high school will be considered for enrollment in certain special programs if recommended by the principal and the appropriate campus department chair and if preparation is equivalent to that required of eligible California high school graduates. Students should have at least a 3.0 GPA in college preparatory subjects or exhibit unusual academic abilities. Such admission is only for a given program and does not constitute the right to continued enrollment. Contact the CSU, Fresno Admissions Office.

Provisional Admission. California State University, Fresno may provisionally admit first-time freshman applicants based on their academic preparation through the junior year of high school. CSU, Fresno monitors the senior year of study of those provisionally-admitted to ensure that they maintain a satisfactory grade point average, including the required college preparatory subjects, and graduate from high school.

Transfer Requirements. You qualify for admission as a transfer student if you have a grade point average of 2.0 (*C*) or better in all transferable units attempted, are in good standing at the last college or university attended, and meet any of the following standards:

1. You meet the freshman admission requirements in effect for the term to which you are applying (see *Freshman Requirements)*.
2. You were eligible as a freshman at the time of high school graduation and have been in continuous attendance in an accredited college since high school graduation, or

   You were eligible as a freshman at the time of high school graduation except for the subject requirements, have made up the missing subjects and have been in continuous attendance in an accredited college since high school graduation.
3. You have completed at least 56 transferable semester (84 quarter) units and have made up any missing subject requirements (see *Making Up Missing College Preparatory Subjects)*. Nonresidents must have a 2.4 grade point average or better. A maximum of 70 transferable semester (105 quarter) units is allowed from two-year institutions (community/junior colleges).

For this requirement, transferable courses are those designated for that purpose by the college or university offering the courses.

Making Up Missing College Preparatory Subject Requirements. Undergraduate transfer applicants who did not complete the subject requirements while in secondary school may make up missing subjects in any of the following four ways:

1. Complete appropriate courses with a *C* or better in adult school or high school summer sessions.
2. Complete appropriate college courses with a *C* or better — one course of three semester (four quarter) units is considered equivalent to one year of high school study.
3. Earn acceptable scores on specified examinations.
4. Transfer applicants with 56 or more semester (84 quarter) units may complete, with a *C* or better in each course, one of the following alternatives:
   a. **1987 or earlier high school graduates:** the CSU General Education requirement in communication in the English language (at least 9 semester units) and mathematics (usually 3 semester units).
   b. **1988 and later high school graduates:** complete a minimum of 30 semester (45 quarter) units to be chosen from courses in English, arts and humanities, social science, science and mathematics of at least equivalent level to courses that meet General Education or transfer curriculum requirements.

All transfer applicants with 56 or more transferable semester units are expected to have completed the General Education requirements in communication in the English language (at least 9 semester units) and in mathematics (usually 3 semester units).

Please consult with any CSU Admissions Office for further information about alternative ways to satisfy the subject requirements.

Honors Courses. Grades, in up to eight semester courses designated as honors in approved subjects and taken in the last two years of high school, receive additional points in

grade point average calculations. Each unit of *A* in approved courses receives a total of 5 points; *B*, 4 points; *C*, 3 points; *D*, 1 point; and none for *F* grades.

Test Requirements. Freshman and transfer applicants who have fewer than 56 semester (84 quarter) units of transferable college work must submit scores from either the Scholastic Aptitude Test (SAT) or the American College Test (ACT). Registration forms and the dates for either test may be obtained from high school or college counselors or from a campus testing office. Or, you may write to the following addresses:

The College Board (SAT)
Registration Unit
Box 592
Princeton, New Jersey
08541

American College Testing
Program (ACT)
Registration Unit
P.O. Box 168
Iowa City, Iowa 52240

TOEFL Requirement. All undergraduate applicants whose native language is not English, regardles of citizenship, must demonstrate English language proficiency through an official TOEFL report showing a minimum score of 500. All graduate applicants must submit a minimum TOEFL score of 550, unless they have a baccalaureate degree from an institution of higher education in which English is the language of instruction. Individual campuses may require higher scores for specific majors.

Systemwide Tests Required of Most New Students. The CSU requires new students to be tested in English and mathematics after they are admitted. These are not admission tests, but a way to determine if you are prepared for college work and, if not, to counsel you how to strengthen your preparation. You might be exempted from one or both of the tests if you have scored well on other specified tests or completed appropriate courses.

English Placement Test (EPT). The CSU English Placement Test must be completed by all new undergraduates unless exempt. (See *Academic Placement* in this catalog.)

Entry Level Mathematics (ELM) Test. All new undergraduate students must take the ELM test and pass it before enrolling in a course that satisfies the quantitative reasoning requirement of the General Education CORE program. Exemptions from the test are given to students only under certain circumstances. (See *Academic Placement* in this catalog.)

Adult Students. As an alternative to regular admission criteria, an applicant who is 25 years of age or older may be considered for admission as an adult student if he or she meets the following conditions:

1. Possesses a high school diploma (or has established equivalence through either the Tests of General Educational Development or the California High School Proficiency Examination).
2. Has not been enrolled in a California community college as a full-time student for more than one term during the past five years. (*Part-time enrollment is permissible.*)
3. Earned a *C* average or better in college coursework during the last five years.

Consideration is based on the applicant's probability of academic success and includes an assessment of basic skills in the English language and mathematical computation. For information, call the *CSU, Fresno Reentry Office, ext. 3040.*

Graduation Requirement in Writing Proficiency. All students must demonstrate competency in writing skills as a requirement for graduation. Information on currently available ways to meet this graduation requirement may be obtained from the Admissions Office or the Testing Office.

Graduate and Postbaccalaureate Admission Requirements

See *Division of Graduate Studies and Research.*

Returning Students

Applicants who seek readmission after an absence of one semester or more must file an application for admission. Applicants absent one semester only are exempt from the $55 application fee *providing* no academic work was taken in the interim at any other institution. Students absent on an approved planned educational leave are not required to file an application for admission and are exempt from the application fee. (See *Planned Educational Leave.*)

International (Foreign) Students

The California State University must assess the academic preparation of foreign students. For this purpose, "foreign students" include those who hold U.S. visas as students, exchange visitors or in other nonimmigrant classifications.

The CSU uses separate requirements and application filing dates in the admission of foreign students. Verification of English proficiency (see *TOEFL Requirement*), financial resources and academic performance are all considered in an admission decision. All academic documents must be submitted in native language, accompanied by a certified English translation. No final admission decision will be made until required materials have been submitted to International Admissions.

Priority in admission is given to residents of California. There is little likelihood of nonresident applicants, including international students, being admitted to either impacted majors or to those programs with limited openings.

At CSU, Fresno admissions decisions are made on the basis of complete academic records from all secondary and college level schools, demonstrated English proficiency based on the results of the Test of English as a Foreign Language (TOEFL) and a certification of financial support.

Information on TOEFL testing dates and centers may be obtained by writing, TOEFL, Educational Testing Service, Princeton, New Jersey 08540 or from the CSU, Fresno Testing Office.

Applicants should take TOEFL at least six months before the beginning of the semester to which they are seeking admission to allow time for receipt and evaluation of test scores.

To qualify for undergraduate admission an international student must present a score of 500 or better on the TOEFL. A postbaccalaureate or graduate student must present a score of 550 or better. The TOEFL score required for admission to specific programs may be higher than the minimum of 500 for undergraduate and 550 for postbaccalaureate applicants indicated above. Students should check these TOEFL requirements in the departmental listings.

To assure that students are prepared to take advantage of the educational opportunities available at CSU, Fresno each international student who must submit TOEFL scores will be

required to participate in a postadmission testing program. The tests will be administered during orientation, immediately before the student's first matriculated semester. The purpose of the testing program is to assess strengths and weaknesses in oral and written English. As a result of the postadmission testing, a student may be required to enroll in certain English as a Foreign Language (EFL) courses as a condition of admission.

An undergraduate student whose academic qualifications are acceptable, but who has not achieved an acceptable TOEFL score may be granted a conditional admission. Such a student must obtain an I-20 Form (Certificate of Eligibility) from an English language school and attend an English as a Second Language (ESL) Program. In order to transfer from a language school to CSU, Fresno a conditionally admitted student must present an acceptable score on the TOEFL.

Applicants to undergraduate majors in business are not eligible for conditional admission.

Determination of Residence for Nonresident Tuition Purposes

The campus Admissions Office determines the residence status of all new and returning students for nonresident tuition purposes. Responses to the Application for Admission and, if necessary, other evidence furnished by the student are used in making this determination. A student who fails to submit adequate information to establish a right to classification as a California resident will be classified as a nonresident.

The following statement of the rules regarding residency determination for nonresident tuition purposes is not a complete discussion of the law, but a summary of the principal rules and their exceptions. The law governing residence determination for tuition purposes by The California State University is found in *Education Code* Sections 68000–68090, 68121, 68123, 68124, 89705–89707.5, and 90408 and in Title 5 of the *California Code of Regulations,* Sections 41900–41912. A copy of the statutes and regulations is available for inspection at the campus Admissions Office.

Legal residence may be established by an adult who is physically present in the state and who, at the same time, intends to make California his or her permanent home. Steps must be taken at least one year prior to the residence determination date to show an intent to make California the permanent home with concurrent relinquishment of the prior legal residence. The steps necessary to show California residency intent will vary from case to case. Included among the steps may be registering to vote and voting in elections in California; filing resident California state income tax forms on total income; ownership of residential property or continuous occupancy or renting of an apartment on a lease basis where one's permanent belongings are kept; maintaining active resident memberships in California professional or social organizations; maintaining California vehicle plates and operator's license; maintaining active savings and checking accounts in California banks; maintaining permanent military address and home of record in California if one is in the military service.



The student who is within the state for educational purposes only does not gain the status of resident regardless of the length of the student's stay in California.

In general, the unmarried minor (a person under 18 years of age) derives legal residence from the parent with whom the minor maintains or last maintained his or her place of abode. The residence of a minor cannot be changed by the minor or the minor's guardian, so long as the minor's parents are living.

A married person may establish his or her residence independent of his or her spouse.

An alien may establish his or her residence, unless precluded by the Immigration and Nationality Act from establishing domicile in the United States. An unmarried minor alien derives his or her residence from the parent with whom the minor maintains or last maintained his or her place of abode.

Nonresident students seeking reclassification are required by law to complete a supplemental questionnaire concerning financial independence.

The general rule is that a student must have been a California resident for at least one year immediately preceding the residence determination date in order to qualify as a *resident student* for tuition purposes. A residence determination date is set for each academic term and is the date from which residence is determined for that term. The residence determination dates are:

Quarter Term Campuses

Fall	September 20
Winter	January 5
Spring	April 1
Summer	July 1

Semester Term Campuses

Fall	September 20
Winter (Stanislaus only)	January 5
Spring	January 25

Questions regarding residence determination dates should be directed to the campus Admissions Office which can give you the residence determination date for the term for which you are registering.

There are exceptions from nonresident tuition, including:

1. Persons below the age of 19 whose parents were residents of California but who left the state while the student, who remained, was still a minor. When the minor reaches age 18, the exception continues for one year to enable the student to qualify as a resident student.
2. Minors who have been present in California with the intent of acquiring residence for more than a year before the residence determination date, and entirely self-supporting for that period of time.
3. Persons below the age of 19 who have lived with and been under the continuous direct care and control of an adult, not a parent, for the two years immediately preceding the residence determination date. Such adult must have been a California resident for the most recent year.
4. Dependent children and spouses of persons in active military service stationed in California on the residence determination date. This exception applies only for the minimum time required for the student to obtain California residence and maintain that residence for a year. The exception, once attained, is not affected by retirement or transfer of the military person outside the state.
5. Military personnel in active service stationed in California on the residence determination date for purposes other than education at state-supported institutions of higher education. This exception applies only for the minimum time required for the student to obtain California residence and maintain that residence for a year.
6. Dependent children of a California resident who has been a California resident for the most recent year. This exception continues until the student has resided in the state the minimum time necessary to become a resident, so long as continuous attendance is maintained at an institution.
7. Graduates of any school located in California that is operated by the United States Bureau of Indian Affairs, including, but not limited to, the Sherman Indian High School. The exception continues so long as continuous attendance is maintained by the student at an institution.
8. Certain credentialed, full-time employees of California school districts.
9. Full-time state university employees and their children and spouses; state employees assigned to work outside the state and their children and spouses. This exception applies only for the minimum time required for the student to obtain California residence and maintain that residence for one year.
10. Certain exchange students.
11. Children of deceased public law enforcement or fire suppression employees, who were California residents, and who were killed in the course of law enforcement or fire suppression duties.

Any student, following a final campus decision on his or her residence classification, may make written appeal only to:

The California State University
Office of General Counsel
400 Golden Shore
Long Beach, California 90802-4275

within 120 calendar days of notification of the final decision on campus of the classification. The Office of General Counsel may make a decision on the issue, or it may send the matter back to the campus for a further review. Students classified incorrectly as residents or incorrectly granted an exception from nonresident tuition are subject to reclassification as nonresidents and payment of nonresident tuition in arrears. If incorrect classification results from false or concealed facts, the student is subject to discipline pursuant to Section 41301 of Title 5 of the *California Code of Regulations*. Resident students who become nonresidents, and nonresident students qualifying for exceptions whose basis for so qualifying changes, must immediately notify the Admissions Office. Applications for a change in classification with respect to a previous term are not accepted.

The student is cautioned that this summation of rules regarding residency determination is by no means a complete explanation of their meaning. The student should also note that changes may have been made in the rate of nonresident tuition, in the statutes, and in the regulations between the time this catalog is published and the relevant residence determination date.

Program Planning and Registration

Freshmen should plan their programs early, beginning, when practical, with the selection of a major. Degree requirements in each major are listed under the appropriate department. Major information sheets are available for most CSU, Fresno majors. If a student is undecided about a major, indicate *Undeclared* on the appropriate forms until a definite decision is reached. For general information, see *Degrees and Credentials.*

An academic adviser is assigned to each student or selected by the student depending on the major department's procedure. Undeclared majors are advised by the Office of Advising and Orientation.

It is recommended that all students meet with a faculty adviser once each semester before registering for classes. A faculty adviser assists the student in planning an academic program, but the primary responsibility for meeting all graduation requirements is the student's.

Recommended Preparation

Freshmen. Overall excellence of performance in high school subjects and evidence of academic potential provide the basis for admission at CSU, Fresno.

Since certain academic majors require high school preparation in definite subjects, the student should consult the requirements indicated in the field of his or her choice.

In university majors, such as engineering, natural science, mathematics, social science and humanities, a maximum number of high school credits should be obtained in appropriate preparatory subjects.

Transfer Students. Students intending to transfer to CSU, Fresno should plan their programs while attending other colleges to meet CSU, Fresno General Education and major degree requirements. Students transferring from a California community college should complete as many of the CSU General Education requirements of that college as possible while keeping in mind that a maximum of 70 transferable units is allowed from two-year institutions (community/junior colleges). A General Education Certification should be sent to CSU, Fresno along with the final transcripts. Earning an A.A. or A.S. degree does not necessarily mean one has fulfilled CSU admission and/or General Education requirements.

After admission to CSU, Fresno, transfer students with 40 or more units will receive a copy of their advanced standing evaluation indicating how previous college units have been applied toward degree requirements at CSU, Fresno. Questions about one's evaluation should be directed to the student's adviser or the Evaluations Office. It is recommended that transfer students bring with them an unofficial copy of all previous college transcripts and their CSU General Education Certification when attending New Student Orientation and Advising Day to ensure accurate advising.

The California Articulation Number (CAN) identifies some of the transferable, lower-division, introductory (preparatory) courses commonly taught on California college campuses.

The system assures students that CAN courses on one participating campus will be accepted "in lieu of" the comparable CAN course on another participating campus. For example: CAN ECON 2 on one campus will be accepted for CAN ECON 2 on every other participating campus. Each



campus retains its own numbering system, but adds the CAN designation parenthetically in its publications. In this catalog, the CAN is listed parenthetically at the end of the course description.

It is expected that most campuses throughout the state will qualify courses to use the California Articulation Numbers. Check with academic advising offices or articulation officers for current listings of CAN courses and campuses participating in the CAN system. A *CAN Catalog* listing campuses and courses is published biannually.

Registration

Registration is open to new and returning students who have been admitted and to continuing students in good standing. Former CSU, Fresno students returning after an absence of one semester or more must apply for readmission, subject to university enrollment limitations and filing deadlines. Students who are returning after an absence of two semesters or more, and those who have been absent one semester and who have attended another institution since last registered at CSU, Fresno are required to pay the $55 application fee when applying. The *Academic Calendar* lists dates of registration. Students who register during the Late Registration period (first 10 days of instruction) are assessed a $25 late fee. No registrations are allowed after the end of late registration. *Registration is complete only when all required forms are completed and filed and all fees are paid.* See the *Academic Calendar* for all deadline dates.

Registration priority for all students, new and returning, is determined by the number of academic units completed with limited exceptions. After a priority group, determined by the faculty-student registration committee, first-time freshmen register, followed by students with the highest number of completed units.

Registration in courses offered by some schools or departments may be restricted to students officially enrolled in certain majors and/or class level. It is essential that each

student's current major be correctly recorded in the university's records. Failure to do so may result in enrollment difficulties. It is the student's responsibility to be sure his or her major is correct as it appears each semester on the Early Registration form, the Enrollment Verification card and on the student's grade report. Undergraduate major changes can be made at the Office of Advising and Orientation; postbaccalaureate and graduate changes at the Office of Graduate Studies; and international student changes at the International Student Services and Programs Office.

Schedule of Courses. An official *Schedule of Courses* is published each semester listing registration procedures, courses offered, class hours and locations, and other important deadlines and updated policy changes as applicable. The schedule is available prior to registration and may be purchased at the Kennel Bookstore for a nominal cost.

Concurrent Registration at Another College or University. Approval of the Registrar must be obtained in advance of registration before transfer credit may be earned at another college concurrently with registration at CSU, Fresno. Normally permission for concurrent registration is not granted for a class that is offered at CSU, Fresno.

Concurrent Registration at Another CSU Campus. A continuing undergraduate student who has completed a minimum of one semester of 12 units on the Fresno campus and is in good standing (2.0 grade point average), or a graduate student who has been and is in an authorized graduate program in good standing may enroll concurrently at another CSU campus without any additional fees. Complete information is available in the Office of the Registrar.

Visitor Registration at Another CSU Campus. A continuing undergraduate student who has completed a minimum of one semester of 12 units and is in good standing or a continuing graduate student who has completed one semester and is admitted to an authorized graduate program may register and pay fees at another CSU campus for one semester without applying for admission to that campus. Complete information is available in the Office of the Registrar.

Full-time/Part-time Students. Students taking at least 75 percent of the normal academic load are considered full-time students. Since the normal academic load is 15 semester hours, students carrying 12 or more semester hours are full-time students. For purposes of financial aid, graduate-level courses are weighted for graduate students. Each graduate unit attempted by a graduate student is considered as 1.5 units.

Full-time	12 or more units
Three-quarter time	9 to 11½
Half-time	6 to 8½

Excess Unit/Enrollment Restrictions — Undergraduate. Undergraduate students are cautioned against registering for more than 18 units without consulting an adviser, since more than 18 units is generally considered to be an academic overload. A limit of 16 units applies to graduate students. See the *Schedule of Courses* for details.

To register for 19 units, an undergraduate student must have an overall grade point average of 2.5; for 20 to 22 units, a student must have an overall grade point average of 3.0. Exceptions to these limits must be approved by the chair of the student's major department. An absolute limit of 22 units (excluding credit by examination units) is enforced which may be waived only with the approval of the dean of the school of the student's major.

An academic department may restrict enrollment by requiring students to drop a class if the student has been disqualified from the major or the student has not achieved a *C* average in the major. This is especially true in academic areas that are impacted or are in high demand.

Enrollment in upper division courses is normally restricted to students with junior, senior, or graduate standing, or who have the necessary prerequisites. Exceptions are subject to the approval of the instructor and department chair. Only students who have been fully approved for admission to credential programs may enroll in certain education courses and qualify for a school service credential on the basis of the university's recommendation.

Credit in any course is also subject to all restrictions that may appear in the *CSU, Fresno General Catalog.*

Excess Units/Enrollment Restrictions — Postbaccalaureate/Graduate. To enroll in 17 or more units, master's degree students must demonstrate a GPA of 3.0 or better; credential students must demonstrate a minimum GPA equivalent to the admission standards of their individual credential program. However, if the credential program requires enrollment in graduate-level (200-series) coursework, the students must demonstrate a 3.0 GPA or better. Second baccalaureate/second undergraduate major/non-objective students may enroll in 19 units if they possess a GPA of 2.5; 3.0 for 20–22 units. Graduate-level (200-series) courses are unavailable to second baccalaureate/major and non-objective students.

Change of Major. Each undergraduate student who wishes to change his or her major must report to the Office of Advising and Orientation to initiate the procedure. International students report to the International Student Services and Programs Office. Graduate and postbaccalaureate students should report to the Graduate Office.

Adding and Dropping Courses. A student is held responsible for the program of courses in which he or she is officially registered. After registration no changes are made or recorded until appropriate add or drop forms have been completed and filed at the Admissions-Records Office by the student. A student is urged to consult an adviser before making a program change. If the class is dropped before the end of the fourth week of classes, the course is not recorded on the permanent record. The end of the fourth week is defined as the end of the twentieth instructional day of the semester. Consult the current *Schedule of Courses* for specific add/drop instructions, procedures and deadlines.

Adding Courses. Once registered, a student may add courses through the end of the fourth week of instruction. It is recommended, however, that a course not be added after the second week if the student has not been attending that course from the start.

Dropping Courses. Through the fourth week of instruction, a student may drop courses without a serious and compelling reason. A notation of the courses will not appear on the permanent record (transcript). After the fourth week of classes, a student may drop a course only for a serious and compelling reason that makes it impossible for the student to complete course requirements. *A serious and compelling reason* is defined as a medical, emotional or other condition

acceptable to and verified by the dean of the school in which the course is offered. The condition must be stated in writing on the drop form. Upon signing the form, the course instructor may add a written recommendation to the school dean in the space provided. The dean may require that the student provide written substantiation as deemed necessary. Failing or performing poorly in a class is not an acceptable serious and compelling reason within the university policy, nor is dissatisfaction with the subject matter, class or instructor. When the drop form has been signed by the dean and processed according to instructions on the form, a *W* is recorded on the student's transcript.

During the final three weeks of instruction, dropping one or more courses is not permitted. A student must completely withdraw unless special approval is given by the registrar in cases such as accident or illness where the cause of the drop is due to circumstances beyond the student's control. If the student has completed a significant portion of the required coursework, incomplete grades are often assigned.

Complete Withdrawal. A student may totally (completely) withdraw from all courses through the last day of instruction. Complete withdrawal is not permitted during the final examination period. If a student withdraws through the first four weeks of instruction, only the date of withdrawal is posted on the permanent record. If the student withdraws after the first four weeks, a *W* is posted for each class as well as the official date of withdrawal. For purposes of subsequent registration and catalog determination, students are considered as having been enrolled for that semester.

A student who withdraws from the university in good academic standing (not disqualified) is eligible to enroll the following semester without reapplying for admission. A student remaining unenrolled at the university for only one semester and not enrolling at another accredited institution during the interim must apply for readmission, may use the short application form available from the Admissions Office and is not required to pay the application fee. However, a student attending another accredited institution or not enrolled for two or more consecutive semesters must reapply and pay the application fee. Consult the current *Schedule of Courses* for specific withdrawal instructions, procedures and deadlines.

Non-Attendance. During the first week of classes, it is the responsibility of students to attend each class meeting of courses in which they are enrolled. Students absent from any class meeting during this period are responsible for personally contacting their instructor by the next class meeting to request being retained in the class.

In addition, as a courtesy to other students on class waiting lists and as a courtesy to the faculty, students who decide to drop a class should contact the instructor immediately. However, the student must not assume that the instructor will exercise his/her option to submit the Administrative Withdrawal Form. In short, it still is the student's responsibility to withdraw properly from any class he/she does not intend to complete. Failure to withdraw will result in the assignment of the appropriate failing grade, *U* or *NC*.

Further, in order to permit a student on a waiting list to enroll in a class, a professor may drop from his/her class any student who is absent from any class session during the first week of classes and does not personally notify the professor by the next class meeting of his/her intent to remain in the course.

My undergraduate years at Fresno State made a real change in my life and profession. The friendly, professional, and informal interaction with the professors made learning a more pleasurable experience. This environment was instrumental in making me change my negative attitude about schools.

Aleardo Zaccheo
Alumnus from Switzerland, Teacher

Preprofessional Preparation

Preprofessional programs are available for students who plan to transfer to other institutions for the completion of professional curricula in such fields as law, medicine, veterinary medicine, pharmacy, dentistry, optometry, forestry, architecture, theology, librarianship, chiropractic, and osteopathic and podiatric medicine. Some of these programs are described below.

Students planning to complete a preprofessional program and degree at CSU, Fresno must complete a major offered at this university. They should include their preprofessional area plus their university major on all registration forms; for example, premedical-chemistry, premedical-biology, prelaw-history, prelaw-political science. There are no preprofessional majors *per se*. Instead, preprofessional students work toward various university degrees and while doing so, incorporate into their college programs courses required for entry into professional school.

Careful program planning is important in order to select proper classes and complete requirements in a timely way. Regular advising is essential since professional schools change their requirements occasionally. Preprofessional students should contact their respective major and preprofessional advisers before enrolling in classes each semester to stay abreast of current developments.

A current list of CSU, Fresno preprofessional advisers is available in the Office of Advising and Orientation.

Premedical. A student interested in preparing for medical school should declare his or her intent at the time he or she applies for admission to CSU, Fresno. To do this, it is necessary that the student use a term such as premedical-sociology, premedical-zoology, premedical-chemistry or premedical-general on all application, admittance and registration papers. In case premedical-general is chosen, a specific subject major should be selected as soon as possible and not later than the sophomore year from the list of approved CSU, Fresno majors in the *Degree Requirements* section of this catalog.

Requirements for admission to medical school vary considerably from one medical school to another and change from time to time, but a well-balanced liberal education is usually specified. Some aptitude and university training in science and English are essential in medicine. The minimum requirements in these subjects specified by most medical schools can be satisfied by specific courses in biology, chemistry, physics and English. Also calculus is required by some medical schools. Because of competition for admission

to medical schools, a grade point average above 3.5 is highly desirable. The Medical College Aptitude Test (MCAT) is required before a student can be accepted into medical school. It is recommended that the MCAT be taken and application for medical school be made at the end of the junior year.

Freshmen, transfer and all other students who are entering the program are advised to contact a premedical adviser prior to registration. (See *Advising and Orientation — Orientation.*) Each student is assigned to a member of the premedical advisory committee who assists him or her in planning a program of courses and advises him or her concerning preparatory procedures for application to medical school.

The Premedical Advisory Committee will mail to any interested student a booklet that covers the operation of the CSU, Fresno premedical program, courses required and medical school admissions procedures. Write to: Premedical Advisory Committee, California State University, Fresno; Fresno, CA 93740.

Predental. The minimum training for dentistry is a six-year course — the first two years (predental training) in a liberal arts college and the remaining four years (dental training) at a school of dentistry.

The minimum predental program required by accredited dental schools is one year each of English, inorganic chemistry, physics and zoology; one semester of organic chemistry; and additional courses (usually elective in general education, but specified by some dental schools) for a total of 60 units. Each science course must include laboratory.

The present trend among dental schools is to require more than two years of predental training including a broad liberal arts background. Since 1971, three years of predental training have been required by the University of California, San Francisco and some other dental schools. Additional organic chemistry, quantitative chemical analysis, elementary physical chemistry, other zoology courses, and in some cases a foreign language and psychology are recommended or required. Several schools require a bachelor's degree for entrance. The American Dental Association Aptitude Test and evidence of physical fitness and good moral character are usually required. Many dental schools also require a personal interview and some administer additional tests. For other information, see the predental adviser and dental school catalogs.

Prelegal. Most fully accredited law schools require a bachelor's degree for admission. Since a prelegal program providing a broad cultural background is recommended by the law schools, any baccalaureate major, depending on the student's interest, may be chosen from the university offerings. (See *Degree Programs, Majors and Minors.*) Law schools suggest courses, but not necessarily a major, in the following: written and oral English, American and English constitutional history, world history, accounting, business administration, elementary logic, mathematics, statistics, economics, political science, philosophy, science and foreign language. For further information consult a prelaw adviser and law school catalogs.

Prelibrarianship. Accredited graduate schools of librarianship require a bachelor's degree for admission. A major in any subject is acceptable. A reading knowledge of at least one modern foreign language is a requirement for admission to most graduate schools of librarianship; this requirement is normally satisfied by the successful completion of two college years of the language. Also, many schools now require a course in mathematics or statistics. In addition, a course in computer concepts is advisable. Students considering librarianship as a career should consult the prelibrary program adviser in the Henry Madden Library.

Preoptometry. California State University, Fresno provides courses for the completion of preprofessional requirements of an optometry program. Most professional schools require junior standing and coursework which includes two years of biology, one year of chemistry, mathematics, physics and English, and one semester of psychology and statistics with above average scholarship. For further information, see optometry school catalogs and consult the preoptometry adviser in the Department of Physics.

The Optometry Admission Testing Program (OAT) exam is required before application can be made to optometry school. Application should be made one year in advance of anticipated enrollment.

Prepharmacy. The first two years (prepharmacy) of a six-year pharmacy program may be completed at CSU, Fresno. All new and transfer students should indicate on application, admittance and registration papers an interest in prepharmacy-biology. Most professional schools require a *C* average or better for a minimum of 60 semester units, including one year each of inorganic chemistry, physics, calculus, zoology, English composition, and literature; one semester of organic chemistry or quantitative analysis; and additional elective courses that are specified in certain areas by some schools. Students may elect to complete more than 60 semester units before applying to pharmacy school. A personal interview may be required of applicants by some schools. For further information, see pharmacy school catalogs and consult the prepharmacy adviser in the Department of Biology.

Preveterinary. Students preparing for the veterinary profession can satisfy their preveterinary curriculum requirements at CSU, Fresno. Preveterinary students should plan to complete a B.S. degree in animal sciences or a B.A. degree in biology prior to application to a school of veterinary medicine. Students should keep in mind, however, that adequate performance on the advanced biology portion of the Graduate Record Examination within five years prior to application is a major requirement for admission to veterinary school in California.

Courses recommended by the Department of Animal Sciences and Agricultural Education for its majors preparing for veterinary school include Animal Science 65A, 125, 135, 165 and 166; Chemistry 1A, 1B, 8 and 109; Physics 2A; Zoology 1, 114 and 160. The School of Agricultural Sciences and Technology is equipped to provide valuable experience with large animals through the student project program. Admission to veterinary school in California requires about 4.5 week-equivalents (180 hours) of relevant animal experience in activities that specifically give the applicant an appreciation and understanding of the profession of veterinary medicine.

Students desiring further information regarding the preveterinary curriculum should consult the chair of the animal sciences department, campus veterinarian and/or the adviser in the biology department.

Business Office
Joyal Administration, Room 152
(209) 278-2764
Accounting Officer, Robert P. Vega

Schedule of Fees

Legal residents of California are not charged tuition. The following reflects applicable fees and nonresident tuition per semester. (Fees are subject to change without advance notice.)

Application fee (Nonrefundable; payable by check or money order at time of applying) $55.00
State university fee:
- 0 to 6.0 units 213.00
- 6.1 and more units 372.00

Facilities fee, all students, per semester 3.00
Nonresident* tuition fee (foreign and domestic), per semester *in addition to other fees:*
- The total amount of nonresident tuition charged shall be based on the number of units taken, per unit or fraction thereof 189.00
- Foreign visa student tuition fee — same as nonresident.

Extension, per unit:
- Lecture or discussion course 75.00

Summer session courses, per unit 95.00

Other fees:
- Identification card fee 2.00
- Graduation fee 10.00
- Diploma fee 20.00
- Diploma replacement, duplicate/reissue 10.00
- Transcript of record (4.00 first copy, 2.00 each additional copy) 4.00
- Thesis binding fee (not a state fee), per copy (includes 35¢ sales tax) 6.50

Credential fee *(collected for Commission on Teacher Credentialing)* Varies. Check with Credential Office, School of Education and Human Development 60.00
Health Service fee (not a state fee), optional, per semester 12.00
Student Body Association fee, all students** (not a state fee), per semester 16.00
Student Body Center fee, all students (not a state fee), per semester 38.00
Instructionally-Related Activities fee, per semester 10.00

Penalties:
- Check returned for any cause 10.00
- Late registration (in addition to student services fee) 25.00
- Failure to meet administratively required appointment or time limit 10.00
- Late filing of student programs 10.00
- Late filing of application for degree 10.00
- Lost or broken items ..... cost or $1.00 if cost is less than $1.00
- Lost library items ..... replacement cost plus $10.00 service charge
- Damaged library items ..... 50¢ up to replacement cost, plus $10.00 service charge

Residence Hall rates:
- Room and board, per semester each student 1,840–1,900

Parking fees: decal (subject to change):
- Fall and spring, per semester 54.00
- Summer Session 36.00
- Lost Decals*** ..... Full Cost

* **Note.** A nonresident student is any person who has not been a bona fide resident of the State of California for more than one year immediately preceding enrollment. The exact determination date may be ascertained by contacting the Admissions/Records Office.

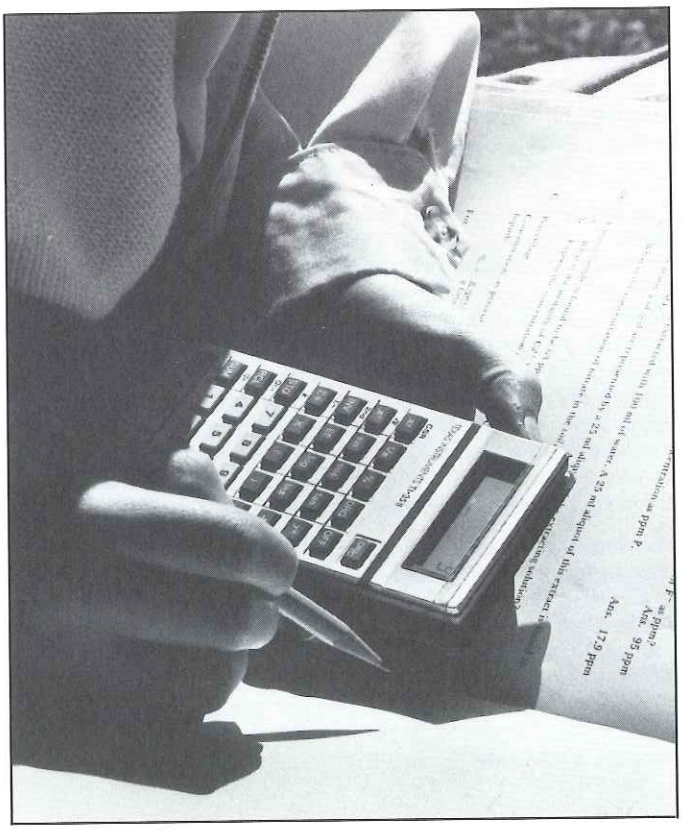
** **Note.** The law governing The California State University provides that a student body fee may be established by student referendum with the approval of ⅔ of those students voting. The Student Body Fee was established at CSU, Fresno by student referendum on May 12, 1959. The same fee can be abolished by a similar ⅔ approval of students voting on a referendum called for by a petition signed by 10 percent of the regularly enrolled students. (*Education Code*, Section 89300). The level of the fee is set by the chancellor. An increase in the student body fee may be approved by the chancellor only following a referendum on the fee increase approved by a majority of students voting. Student body fees support a variety of cultural and recreational programs, child care centers and special student support programs.

*** **Note.** The university is not responsible for lost decals. Replacements may be purchased at full cost only.

Credit Cards. VISA and MasterCard bank credit cards may be used for payment of Student Fees.

Alan Pattee Scholarships

Children of deceased public law enforcement or fire suppression employees, who were California residents and who were killed in the course of law enforcement or fire suppression duties, are not charged fees or tuition of any kind at any California State University campus, according to the Alan Pattee Scholarship Act, *Education Code* Section 68121. Students qualifying for these benefits are known as Alan Pattee scholars. For further information, contact the Admissions/Registrar's Office, which determines eligibility.



Refund of Fees

Fees may be refunded only as authorized by Sections 41803 (parking fees), 41913 (nonresident tuition), 42019 (housing charges), and 41802 (all other fees) of Title 5, *California Code of Regulations*. Whether a fee may be refunded and the circumstances under which a fee or any part of a fee may be refunded, vary depending on the particular fee involved. Requirements governing a refund may include such matters as the reason for seeking a refund (for example, death, disability, compulsory military service), the number of days of instruction that have elapsed before application for refund is made and the degree to which the campus has provided the services for which the fee has been charged.

The student must file a written application for refund of fees stating the reason for the refund request with the Admissions and Records Office. The application should be filed at the earliest possible date since the refund will be denied if submitted beyond certain time limits. For example, requests for refund of state university fee, student body organization fees and student body center fees must be made no later than 14 days following the commencement of instruction and requests for refund of extension course tuition fees must be made prior to the fourth meeting of the class.

Details concerning the fees that may be refunded, the circumstances under which fees may be refunded, and the appropriate procedure to be followed in seeking refunds may be obtained from the university Accounting Office, Joyal 181, (209) 278-2772.

Registration Fees. After a student makes a formal withdrawal from the university through the Student Records Office, a refund of a portion of the *state university fee* may be made if a written application for refund is filed not later than 14 calendar days after the first day of instruction. A student shall make the application personally; if in the opinion of the administration, he or she is unable to do so, the parents or guardian of the student who is a minor, or the legal representative of the student may make the application. (See *California Code of Regulations,* Title 5, Section 41802.)

The amount of the refund will be determined by the Business Office by deducting $5 for registration costs. A full refund may be made to a student who is unable to continue a course because of a university regulation, compulsory military service, death or disability at any time prior to the date the student receives any academic credit for any course or courses for which he or she is registered less $5. The student body and student activity cards must be turned in with the refund application. The *late registration fee* is not refundable. *There is a refund for a reduction in the student's unit load, if unit load is reduced to a lower fee category not later than 14 days following the day of the term when instruction begins.*

The same withdrawal and application for refund procedure applies for the *nonresident tuition fee* except that the time limit is different. There may be a refund for reduction in unit load. Within the first week of the session, a full refund may be made for units dropped. For each additional week, the refund diminishes as follows: 90 percent of the fee, the second week; 70 percent, the third week; 50 percent, the fourth week; 30 percent, the fifth week; 20 percent, the sixth week; no refund, after the sixth week.

Parking Fees. A student is entitled to a refund of parking fees in the amount shown in the following schedule if on any one calendar day within the applicable period the student files with the Business Office a written application for refund and returns all documents issued to him or her by the university which evidence their right to use the parking facility including any parking permit, stickers and decal so issued. If the decal is attached to a vehicle and the vehicle is presented to the university for removal of the attached item by or under the direction of the state, such presentation and removal shall constitute return of the attached item.

Beginning with the first day of instruction, 75 percent of the parking space fee is refunded if application is made as indicated above within 1–30 calendar days; 50 percent, within 31–60 calendar days; 25 percent, within 61–90 calendar days; no refund, 91 days to end of semester.

Housing Facility Fees. The licensee of a residence hall facility in instances of cancellation, revocation or vacating shall owe fees as provided in Section 42019 of Title 5, *California Code of Regulations,* regardless of whether the licensee ever assumed actual occupancy and regardless of whether a licensee who has assumed actual occupancy moves out prior to the designated period of obligation. The university shall refund all money collected in excess of such obligation as soon as reasonably possible. A copy of Title 5, Section 42019 is available in the Henry Madden Library, Student Affairs Office and Housing Office.

Estimate of Expenses

The basic expenses for attendance at CSU, Fresno for a year (two semesters) for full-time students who live away from home ranges from approximately $4,400 to $5,200. These figures are exclusive of nonresident tuition fee, but include an estimate of such personal items as clothes, laundry and incidental expenditures. Students who live at home or share apartments with other students and commute to the campus are able to reduce their expenses considerably below the estimated figure. The cost of room and board may also be reduced by cooperative living arrangements or part-time work in exchange for room and board.

Room and Board	$3,680–3,800
Registration Fees	$564–864
Books and Supplies	$200–355

Average Annual Cost of Education and Sources of Funds per Full-Time Equivalent Student. The 20 campuses and the Chancellor's Office of The California State University are financed primarily through funding provided by the taxpayers of California. The total state appropriation to the CSU for 1989/90, including capital outlay and employee compensation increases, is $1,831,731,000. The total cost of education for CSU, however, is $2,023,455,068 which provides support for a projected 267,380 full-time equivalent (FTE)[a] students.

The total cost of education in the CSU is defined as the expenditures for current operations, including payments made to the students in the form of financial aid, and all fully reimbursed programs contained in state appropriations, but excluding capital outlay appropriations. The average cost of education is determined by dividing the total cost by the total FTEs. The average cost is further differentiated into three categories: state support (the state appropriation, excluding capital outlay), student fee support, and support from other sources (including federal funds).



Thus, excluding costs that relate to capital outlay (i.e., building amortization), the average cost of education per FTE student is $7,568. Of this amount, the average student fee support per FTE is $1,106. The calculation for this latter amount includes the amount paid by nonresident students.

Source of Funds and Average Costs for 1989/90 CSU Budget (Projected Enrollment: 267,380 FTE)

	Amount	*(FTE)*[a]	*Percent*
TOTAL COST OF EDUCATION	$2,023,455,068 [b]	$7,568	100.0
— State Appropriation	1,644,823,000 [c]	6,152	81.0
— Student Fee Support	295,759,156	1,106 [d]	15.0
— Support from Other Sources	82,872,912	310	4.0

[a] Average Cost Per Student. For budgetary purposes, full-time equivalent (FTE) translates total head count into total academic student load equivalent to 15 units per term. Some students enroll for more than 15 units; some students enroll for fewer than 15 units.

[b] The total cost of education does not include the amount related to lottery and the capital investment of the CSU. The estimated replacement cost of all the system's permanent facilities and equipment on the 20 campuses is currently valued at $6.5 billion, excluding the cost of land.

[c] This figure does not include the capital outlay appropriation of $186,908,000.

[d] The average costs paid by a student include the state university fee, application fee and nonresident tuition. Individual students may pay less than $1,106 depending on whether they are part-time, full-time, resident or nonresident students.

Debts Owed to the Institution

Should a student or former student fail to pay a debt owed to the institution, the institution may "withhold permission to register, to use facilities for which a fee is authorized to be charged, to receive services, materials, food or merchandise, or any combination of the above from any person owing a debt" until the debt is paid (see Title 5, *California Code of Regulations,* Sections 42380 and 42381). For example, the institution may withhold permission to receive official transcripts of grades from any person owing a debt. If a student believes that he or she does not owe all or part of an unpaid obligation, the student should contact the campus business office. The business office, or another office on campus to which the student may be referred by the business office, reviews the pertinent information, including information the student may wish to present, and advises the student of its conclusions with respect to the debt.

VIP Bike Registration. The Volunteer Identification Program is available free of charge on the CSU, Fresno campus. With this service your bike is engraved with your driver's license number or a serial number and is listed on a statewide computer system if stolen. Forms for VIP registration are available at the University Student Union information desk, the residence halls and the Commons #4 Office, and the Campus Security Office.

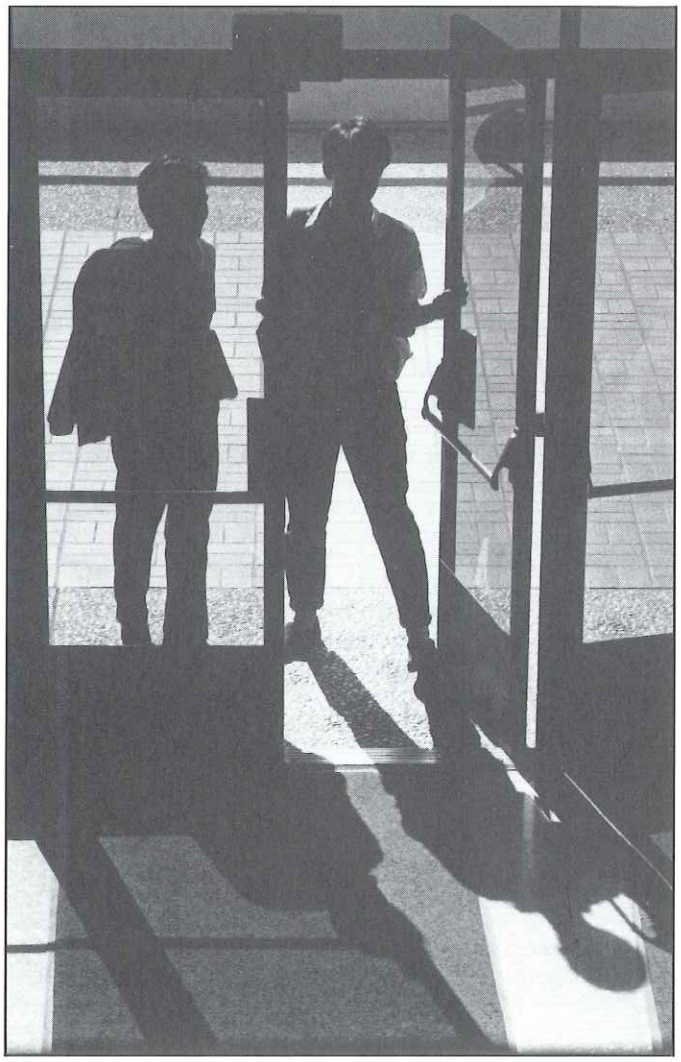
Financial Aid

Financial Aid Office
Joyal Administration, Room 296
(209) 278-2182
Director, Joseph W. Heuston

Financial aid is any resource available to students to offset the costs associated with attending California State University, Fresno. Aside from student and family resources, there are four basic programs of financial aid: grants, loans, work-study and scholarships. Approximately 95 percent of these programs are administered by the Financial Aid Office.

The majority are funded by the federal and state governments and are need-based. Eligibility for financial aid from need-based programs is determined through a formula mandated by Congress. Several programs administered by the Financial Aid Office are not need-based. There are also additional administrative units on campus that offer financial aid.

The following outlines the sources of financial aid at California State University, Fresno.



Need-Based Financial Aid Programs

The following programs are need-based and require that the Student Aid Application for California (SAAC) be submitted before March 2, 1990, for priority processing.

Perkins Loan (formerly National Direct Student Loan)
Supplemental Educational Opportunity Grant
College Work-Study
Nursing Student Loan
Bureau of Indian Affairs Grant
**California Graduate Equity Fellowship Program for Underrepresented Students
California State Educational Opportunity Grant (EOP)
California State University Grant
*Pell Grant
Cal Grants A and B
State Graduate Fellowship
*Stafford Student Loan
**Patricia Roberts Harris Fellowship

Students who wish to be considered for participation in any of the above programs for 1990–91 should submit a SAAC form in January or February 1990. Workshops on completing the SAAC are offered by the financial aid staff in January and February. For details, contact the Financial Aid Office.

*__Note:__ Even though the March 2 deadline does not apply to the Pell or Stafford Student Loan Programs, students should be aware that Pell and Stafford applications submitted after May 30, 1990, cannot be assured of receiving funds at the beginning of the fall semester.

**Graduate Equity Fellowship and Patricia Roberts Harris Fellowship application deadlines may vary.

The details of these programs are listed at the end of the chapter under the heading Program Specifications.

Non-Need-Based Financial Aid Programs

The Financial Aid Office also administers non-need-based aid programs. These programs are available to students and families regardless of income and assets. Applications for these programs are available in Room 296, Joyal Administration Building. The non-need-based programs include:

1. California State University, Fresno Institutional Scholarships
   — All students must file a scholarship application between November 1, 1989, and February 1, 1990.
2. Parent Loans for Undergraduate Students (PLUS) Supplemental Loan for Students (SLS)
   — No set deadline. However, applicants who submit their application after May 30, 1990, cannot be assured of receiving funds before the beginning of the fall semester.

Additional information about these programs may be found under Program Specifications.

Additional Financial Aid Sources

Alan Patee Scholarships. Children of deceased public law enforcement or fire suppression employees, who die in the course of performing their duties, are exempted from paying fees or tuition at any California State University campus. Additional details may be obtained from the University Registrar, who determines eligibility.

Air Force Reserve Officer Corps Scholarships. Scholarships are available to cover the costs of fees and tuition, books and lab fees. Applications should be submitted to the chair of the Aerospace Studies Department. For additional information, refer to Aerospace Studies.

United States Army Reserve Officers Training Corps (ROTC). All students formally enrolled in the ROTC Program receive at least $1,000 a year and can earn as much as $10,000 during their college careers. The U.S. Army also offers scholarships, which cover tuition, fees, books and a monthly stipend of $100. For additional details, refer to Military Science.

Graduate Assistantships. A number of graduate assistantships and teaching assistantships are available to students who are enrolled in a master's degree program. Stipends range from $2,926 to $9,641. For additional details, refer to Graduate Studies and Research.

Resident Advisers. The university employs a number of students as advisers in its residence hall program. These positions are available to students whose interest and background indicate competence in this type of work assignment. Although stipends vary, generally, they cover the cost of room and board. Applications are available from the Director of Housing at the beginning of the spring semester.

University Association and Foundation Loan Funds. The university operates an Emergency Loan Fund to assist students who need up to $200 for educationally-related emergency expenses. These loans have to be repaid within 60 days or at the end of the semester, whichever comes first. Loans are granted on the basis of the students' need, educational program and ability to repay. There are also limited funds available for loans up to $500, repayable after graduation. These funds, however, are restricted to "worthy upper division and graduate students majoring in education and working for a teacher's credential at CSU, Fresno." The funds for these programs have been provided by gifts to the university. Applications for loans are processed through Student Aid Accounting, Joyal Administration Building, Room 275.

Waivers of Nonresident Fees. Upon written waiver by the Dean of Student Affairs or the Director of Admissions and Records, children or spouses of California State University full-time employees, who are not yet legal residents of California, may be exempted from the nonresident fee. Also, with verification by the dean of the School of Education and Human Development, certificated California school district employees who are not yet legal residents of California may be exempted from the nonresident fee, it they are provisionally credentialed and working toward regular credentials, completing postponed requirements, or completing the fifth year required under the Teacher Preparation and Licensing Law of 1970 (Ryan Act).

Division of Graduate Studies Student Research Awards and Travel Grants. Awards are available each semester on a competitive basis to students in the form of grants for research associated with a thesis or project. Travel grants are available to graduate students who have had a paper accepted to be read at a major, professional conference. The amount of the award is $500. For further information, contact the Division of Graduate Studies, (209) 278-2448.

Program Specifications

Need-based financial aid programs. Students in receipt of funding through the following federal and state programs must be making satisfactory progress as defined by statute. Failure to comply with these regulations may jeopardize receipt of student aid funds.

Perkins Loan (Formerly National Direct Student Loan). Authorized by the Higher Education Act, this program provides a limited amount of low-interest loans to students who demonstrate an exceptional financial need. Currently, students may borrow $9,000 during the course of their undergraduate degree. Graduate students may borrow up to $18,000 (including any amount borrowed as an undergraduate). New borrowers begin repayment nine months after they graduate, leave school or cease attending at least half-time. (Students who received funding under the National Direct Student Loan Program have a six–month grace period.) A repayment period of up to 10 years has been established by the federal government. The Higher Education Act also authorized certain conditions under which part or all of the loan may be canceled. Details are available in the federal government publication, *The Student Guide,* which is available in the Financial Aid Office.

Supplemental Educational Opportunity Grant (SEOG). SEOG is a grant program and, thus, does not require repayment. Awards are restricted to those undergraduates who demonstrate the greatest need according to the formula mandated by the federal government. Funding for the program is limited to the allocation received from the federal government. At CSU, Fresno, a SEOG annual award seldom exceeds $200. Priority is given to students who demonstrate eligibility for Pell.

College Work-Study (CWS). The College Work-Study Program is a federally-funded, campus-based employment program. The same eligibility requirements that govern the Perkins Loan and the SEOG apply to College Work-Study. Both undergraduates and graduate students are eligible to participate. At CSU, Fresno, students receiving CWS awards are placed in jobs on campus and with selected off-campus agencies. CWS recipients may work up to 20 hours per week on a job.

Nursing Student Loans. Under this program, a student who can show that a loan is needed to enter or continue in the nursing program may borrow up to $2,500 an academic year for the first two years; $4,000 for the final two academic years, up to a $13,000 maximum. No interest is charged while the borrower pursues at least a half-time course of study, or for a period of nine months after leaving school. Interest then starts at 5 percent simple interest and the loan is repaid at not less than $15 per month. Interest and payments are deferred for a period of time while the borrower is a member of the uniformed service or is a volunteer under the Peace Corps Act.

Bureau of Indian Affairs (BIA) Grants. If you are at least one-fourth American Indian, Eskimo or Aleut, as recognized by a tribal group served by the Bureau of Indian Affairs, you may apply for a BIA grant. The amount is based on financial need and availability of funds from your area agency. You must first submit an application for financial aid and supportive documents. Obtain an application from your area agency or the Financial Aid Office, then see the BIA adviser in the Financial Aid Office to complete the BIA application. Deadlines may vary, but in most cases, BIA applications need to be in the agency office prior to June 1.

California Graduate Equity Fellowship Program for Underrepresented Students. In an effort to overcome underrepresentation, some funds are available to students in a master's degree program providing these students satisfy all required criteria. Recipients are 1) required to maintain a grade point average of 3.0 or better, 2) belong to one of the following underrepresented groups: Black, Chicano/Mexican American, other Hispanic, American Indian, Filipino, Pacific Islander or women in a master's program in which men predominate; disabled students may also qualify, 3) qualify as a resident of the State of California for payment of fees at the university, 4) be prepared to demonstrate financial need. Additional information may be obtained from the Graduate Office.

Minority Advancement and Graduate Incentive Program. The purpose of the Minority Advancement and Graduate Incentive (MAGIC) Program is to increase the number of minority Black, Hispanic and American Indian students pursuing master's degrees in the fields of education, engineering and natural sciences. Through this program, selected graduate students with financial need receive a Patricia Roberts Harris Fellowship, which may provide up to $10,000 plus university fees and become participants in a program of professional enrichment and leadership development. Students in this program pursue graduate study on a full-time basis and are given opportunities to network with academic and practicing professionals in their field of study from throughout the nation. Successful fellows may receive additional support for a second year of study toward the completion of the master's degree.

Patricia Roberts Harris Fellowship. This is a need-based program for graduate students in specific master's programs. Additional information may be obtained from the Graduate Office.

California State Educational Opportunity Grant Program (State EOP). Educational Opportunity Program Grants are provided by the State of California for students admitted to any one of the 20 campuses of The California State University under the Educational Opportunity Program. Eligibility for this grant is determined by criteria similar to that which governs federal financial aid programs. Admission to the university through the EOP does not automatically mean that the student is awarded a State EOP Grant. Grants provide aid to undergraduate students who, for lack of such assistance, would be unable to enter or remain in an institution of higher education. Funds are limited and range from $200 to $1,000 for the academic year.

California State University Grant. This is a need-based program for California residents, providing financial support to students equal to the assessed State University Fee. Eligibility for this grant is determined by criteria similar but not limited to that which governs federal financial aid programs.

Pell. The Pell Grant Program is a program of student financial aid that was authorized by Title IV, Part A, of the Education Amendments of 1972. This program provides grants for all eligible undergraduate students to assist them in meeting educational costs. Program regulations change from year to year. Check with the Financial Aid Office for the regulations now in effect.

Cal Grants A and B. The California Student Aid Commission offers Cal Grants A and B to undergraduate students on the basis of demonstrated need and specific program requirements. To apply, complete the Student Aid Application for California (SAAC) — checking the appropriate box — and return it by March 2, 1990. Recipients who complete a baccalaureate degree on or after 1989 and who are accepted and enrolled in a teaching credential program at an institution approved by the California Commission on Teacher Credentialing will be eligible to apply for renewal of their Cal Grant award for an additional year of grant eligibility, provided financial need continues to exist. All students who are planning to enroll in an approved credential program and wish to continue receiving Cal Grant benefits will be required to submit a Request Form G44.1.

Paul Douglas Teacher Scholarship. The Paul Douglas Teacher Scholarship is a federally-funded program providing college scholarships to outstanding high school graduates and college students who demonstrate commitment to pursuing teaching careers at the preschool, elementary or secondary level. Participants must agree to teach two full-time years for each year of scholarship coverage. Failure to do so will require repayment of the scholarship, plus interest and collection fees. Applications for 1990–91 will be available after January 1, 1990 for college students and after March 1, 1990 for high school students.

Law Enforcement Personnel Dependents Scholarship. The Law Enforcement Personnel Dependents Scholarship will pay for books and supplies and living expenses up to $1,500 per year for needy dependent children of law enforcement officers who have been killed or totally disabled in the line of duty. Applicants should write to the California Student Aid Commission for a special application.

State Graduate Fellowship. The Student Aid Commission also administers the State Graduate Fellowship Program for tuition assistance for masters and doctoral students. To apply, complete the Student Aid Application for California (SAAC) — checking the appropriate box — and return it by March 2, 1990.

Stafford Student Loan (formerly the California Guaranteed Student Loan Program). The Stafford Program enables students with financial need to secure loans for the payment of educational expenses. Available to undergraduates and graduates, the Stafford Loan is a federally-subsidized (and insured) program, offered in conjunction with the California Student Aid Commission, through California banks and lending institutions (banks, credit unions, savings and loan associations, etc.). Undergraduates who qualify may borrow up to $2,625 per year (as freshmen or sophomores) or $4,000 per year (as juniors, seniors or credential students), up to a $17,250 maximum. Graduate students who qualify may borrow up to $7,500 per year, to a $54,750 maximum (includes indebtedness incurred as an undergraduate). Simple interest, at the rate of 7 to 9 percent per annum, is charged on loans for students who have previous outstanding loans at 7 to 9 percent per annum, and 8 percent is charged for all new loans. Repayment for 8 percent loans begins six to nine months after students graduate, leave school or cease attending at least half-time. (Since interest rates, repayment periods, etc. have changed frequently, the student is advised to contact the Financial Aid Office for more precise information.) The federal government pays the interest until the student borrower enters the loan repayment period. Applications may be obtained from the Financial Aid Office.

Non-Need-Based Financial Aid Programs

The following non-need-based financial aid programs are administered by the California State University, Fresno Financial Aid Office.

California State University, Fresno Institutional Scholarships. Each year about 900 students are awarded Institutional Scholarships totaling more than $510,369. The majority of the scholarships, ranging from $100 to $2,000, are awarded on the basis of merit to both undergraduate and graduate students. Although requirements for specific scholarships vary, most scholarships require academic achievement or potential, plus a demonstration of the students' commitment to their school, community or society. Financial need may be a factor, but is seldom the exclusive factor. Applications must be submitted by February 1, 1990. The CSUF Scholarship Application is available in Room 298, Joyal Administration Building.

Parent Loans for Undergraduate Students (PLUS); Supplemental Loan for Students (SLS). The PLUS/SLS Program was initiated to provide assistance to parents or students who are either ineligible for other aid programs, or do not demonstrate financial need as determined by the government formula. Parents may borrow up to $4,000 per year, to a total of $20,000 for each dependent child enrolled at least half-time. Graduate students and independent undergraduates may borrow up to $4,000 per year, to a total of $20,000. Applications and information are available at the California State University, Fresno Financial Aid Office.

CSU, Forgivable Loan/Doctoral Incentive Program for Minorities and Women. The objective of this program is to increase the number of minority and women faculty members in academic fields where minorities and women are underrepresented in the California State University system of 20 campuses. High priority is given to areas where severe underrepresentation of minorities and women exist: physical and life sciences, mathematics, computer science and engineering. This program provides financial support up to $10,000 per year for three years of doctoral studies. For each postdoctoral year of full-time teaching in the CSU, 20 percent of the loan will be reduced for up to five years. Information and applications are available in the Affirmative Action Office, Upstairs Cafeteria, Room 201.

California Predoctoral Program for Undergraduate and Graduate Students. The objective of this program is to increase the number of California State University minority students, disabled students, and women students in academic fields where they are underrepresented and to encourage them to continue their studies through the earning of a doctorate. A special emphasis will be placed on increasing the enrollment of CSU minority, disabled and women graduates in doctoral programs at one of the campuses of the University of California. The program provides travel funds for qualified students to visit institutions that grant the doctorate and/or to attend a professional meeting with a faculty sponsor. Students in the program will also participate in a summer research program at a UC or CSU campus. Additional information and application forms are available through department chairs and the dean of Graduate Studies and Research, Thomas Administration Building, Room 132.

Institutional and Financial Assistance

The following information concerning student financial assistance may be obtained from Joseph W. Heuston, director of financial aid, Joyal Administration Building, Room 298, (209) 278-2182:

1. Student financial assistance programs available to students who enroll at CSU, Fresno.
2. The methods by which such assistance is distributed among recipients who enroll at CSU, Fresno.
3. The means, including forms, by which application for student financial assistance is made and requirements for accurately preparing such application.
4. The rights and responsibilities of students receiving financial assistance.
5. The standards the student must maintain to be considered to be making satisfactory progress for the purpose of establishing and maintaining eligibility for financial assistance.

The following information concerning the cost of attending CSU, Fresno is available from Robert P. Vega, accounting officer, Joyal Administration Building, Room 152, (209) 278-2764:

1. Fees and tuition (where applicable).
2. Estimated costs of books and supplies.
3. Estimates of typical student room and board costs or typical commuting costs.
4. Any additional costs of the program in which the student is enrolled or expresses a specific interest.
5. The refund policy for the return of unearned tuition and fees or other refundable portions of costs.

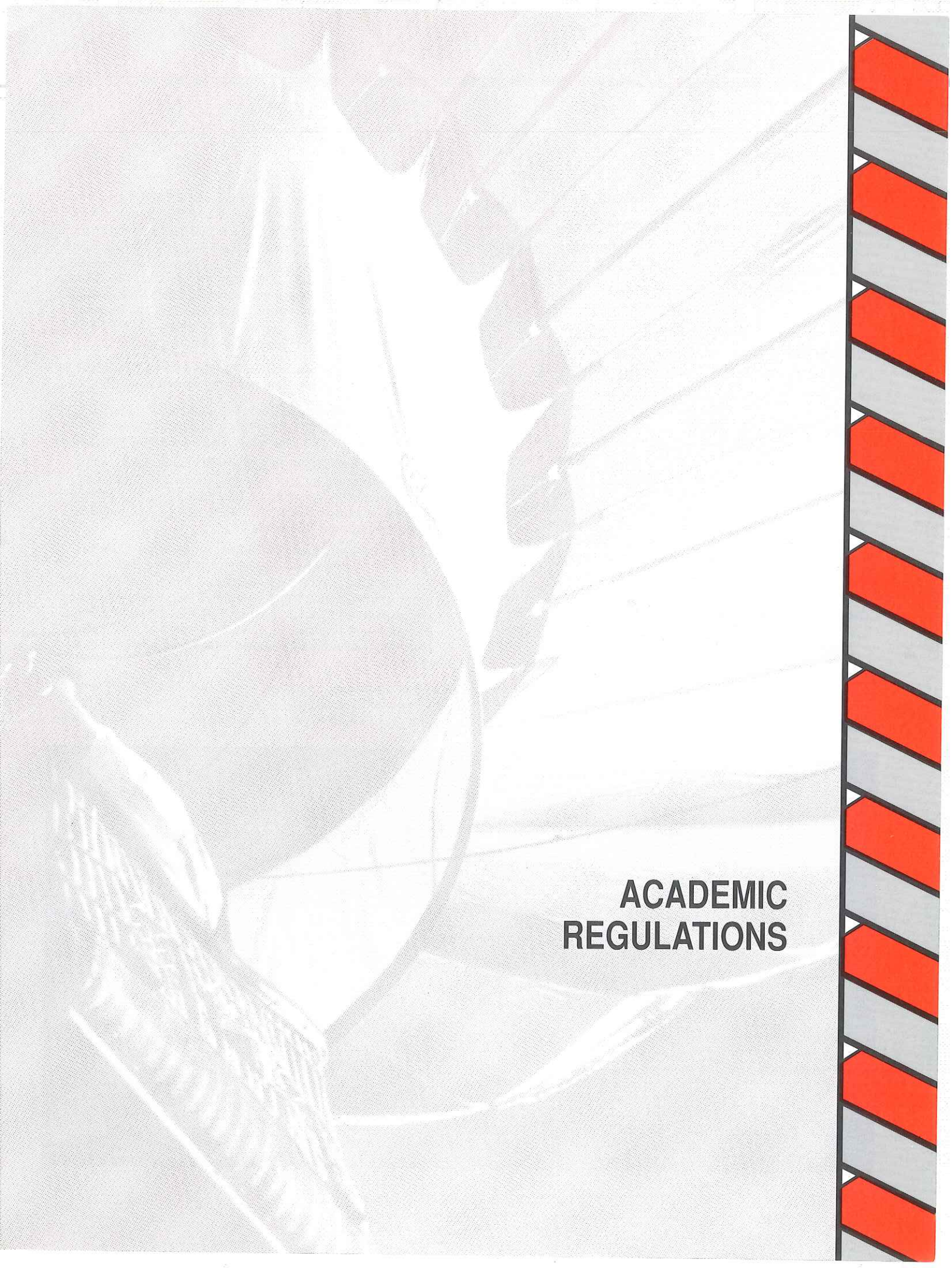
Information concerning the refund policy of CSU, Fresno for the return of unearned tuition and fees or other refundable portions of costs is available from Robert Vega, accounting officer, Joyal Administration Building, Room 152, (209) 278-2764.

Information concerning the academic programs of CSU, Fresno may be obtained from J. Leonard Salazar, assistant vice president for academic affairs, Thomas Administration Building, Room 110, (209) 278-4775 and may include:

1. The current degree programs and other educational and training programs.
2. The instructional, laboratory and other physical plant facilities that relate to the academic program.
3. The faculty and other instructional personnel.
4. Data regarding student retention at CSU, Fresno and, if available, the number and percentage of students completing the program in which the student is enrolled or expressed interest.
5. The names of associations, agencies or governmental bodies that accredit, approve or license the institution and its programs, and the procedures under which any current or prospective student may obtain or review upon request a copy of the documents describing the institution's accreditation, approval or licensing.

Information regarding special facilities and services available to handicapped students may be obtained from Weldon W. Percy, coordinator of Disabled Students Services, Main Cafeteria West 125, (209) 278-2811.





ACADEMIC REGULATIONS

California State University, Fresno is authorized to grant the Bachelor of Arts, Bachelor of Science, Bachelor of Vocational Education, Master of Arts, Master of Science, Master of Business Administration, Master of City and Regional Planning, Master of Public Administration and Master of Social Work degrees. See *School of Education and Human Development* for public school credentials for which the university is authorized to recommend candidates.

Definition of Key Terms

Additional Requirements. Courses from one or more departments or programs outside the major that are required for preparatory or foundational purposes. Such courses are not included in the minimum 2.0 grade point average required for graduation in the major and may be waived or substituted at the discretion of the major department or program. Additional requirements normally may be applied toward a minor. Additional requirements may also be applied toward General Education unless specifically prohibited by the major department.

CORE. 1) One of the three main parts of the current General Education Program. 2) A common set of courses within a major or minor that all students are required to complete.

CAPSTONE. CAPSTONE is part of General Education. The courses used to satisfy the CAPSTONE requirement provide an interdisciplinary experience in which the skills and knowledge developed in CORE and BREADTH are integrated and their interrelationships are brought into focus. The CAPSTONE requirement may be met by completing a minimum of six units in specific upper-division, interdisciplinary courses or by completing a minimum of six units in a single cluster of interrelated upper-division courses from two different departments. Some clusters also have additional restrictions. One course must satisfy the upper-division Critical Thinking requirement — indicated by (CT) in the listing of CAPSTONE courses. (See *General Education CAPSTONE.*)

Concurrent Enrollment. The term *concurrent enrollment* is used to describe several different types of enrollment:

1. Open University Enrollment. Nonmatriculated students may enroll in regular CSU, Fresno classes through the Division of Extended Education. (See *Extended Education.*)
2. Concurrent Enrollment at Other CSU Campuses. CSU students may attend two CSU campuses simultaneously. This type of enrollment is not often used by CSU, Fresno students because of the distance to other CSU campuses. (See the registrar for details.)
3. Concurrent Enrollment at Another (non-CSU) College. Approval for concurrent enrollment at another college must be obtained from the registrar before the end of the second week of instruction. Transfer credit is not awarded unless permission is obtained. Normally, permission for this kind of concurrent registration is not granted for a class that is offered at CSU, Fresno unless department approval is granted.

Double-Counting. Allowing one course to fulfill two separate requirements concurrently; e.g., allowing one course to fulfill both a major requirement and the upper-division writing skills



requirement, or allowing one course to fulfill both a major requirement and General Education CORE or BREADTH requirement.

The completion of both General Education and a major is required for a degree. The goal of General Education is to ensure a background that has solid foundations and broad scope. A student's major provides depth in a specific area, some foundations of which are in other disciplines.

The following double-counting policy pertains to General Education: 1) A CORE class also may be applied to a student's major requirement unless the department specifically prohibits it. 2) A maximum of two courses from a student's major also may be applied to satisfy BREADTH requirements. However, a department or program may prohibit any General Education BREADTH course from simultaneously satisfying its own departmental or programmatic requirements. 3) Courses used to satisfy CAPSTONE may not be used to satisfy requirements for the major.

Electives. Courses/units a student selects to complete the total unit requirement for the baccalaureate degree.

Grade Point Average (GPA). The grade point average is a measure of academic scholarship and performance which is computed by dividing units registered into grade points earned. Three separate GPAs are computed on the student's grade report each semester: 1) cumulative GPA for all baccalaureate or postbaccalaureate units, as appropriate; 2) cumulative GPA for total CSU, Fresno units; 3) GPA for that semester only. A minimum of a *C* average (2.0 GPA) for units in the major, all CSU, Fresno units and total units is required for a baccalaureate degree. (See *Grade Symbols and Grade Points; Degree Requirements*). Master's degree students have a higher minimum GPA requirement. (See *Graduate Studies and Research — Advancement to Candidacy, Grade Requirements.*)

Major. Set of required courses from one or more departments designed to provide students with the knowledge, skills and experiences necessary to pursue a specific career and/or advanced study. A student must earn a 2.0 grade point average in all courses required for the major, except "additional requirements," in order to graduate. (Minimum Title 5 requirements: *B.A. degree* — 24 units of which 12 must be upper division exclusive of General Education; *B.S. degree* — 36 units of which 18 must be upper division exclusive of General Education.)

Minor. Set of required courses from one or more departments or programs but less comprehensive than the major. Courses fulfilling requirements for a minor usually may be counted toward General Education. Refer to the description of the specific minor for exceptions. Courses in a major cannot be applied toward a minor unless designated as "additional requirements."

A minor may be earned only at the time a student earns the first baccalaureate degree.

Option. Set of required courses within a major in addition to the major core courses that emphasizes one important aspect of that school, department or program.

Prerequisite Requirements. 1) Course or courses that must be completed before a higher level course may be taken, sometimes allowed by the instructor to be taken concurrently; 2) Courses outside the major department that must be completed before admission to the major.

Recommended Courses. Courses that the department faculty believe would be beneficial for a student to take but are not mandated or required as part of the major.

Units. A credit or semester unit represents one hour of class work per week for one semester. It is assumed that two hours of preparation are required for each hour in class. Three hours of laboratory per week are the equivalent of one unit. In a limited number of courses two hours of laboratory per week are the equivalent of one unit. Also, two hours of activity or studio (art, dance, music, physical education) are normally equivalent to one unit of credit. One quarter unit of credit is equivalent to two-thirds of a semester unit.

Units registered and units allowed are terms that appear on the students' grade report, transcript and evaluation. Units registered is the column used for GPA calculation. The units allowed column is used to determine units completed toward the total unit requirement for the degree.

Choice of Catalog (Election of Regulations)

An undergraduate student must fulfill degree requirements from one catalog, not the most favorable requirements from two or more catalogs. As long as a student maintains "continuous attendance,"* he or she may elect, for purposes of fulfilling graduation requirements, one of the following:

1. The catalog in effect at the time a student begins attending a California public community college or California State University campus.
2. The catalog in effect at the time a student begins attending CSU, Fresno.
3. The catalog in effect at the time the student graduates from CSU, Fresno.

Continuous attendance is defined as being officially enrolled at least one semester or two quarters during a calendar year regardless of the number of units completed. Also, a student is considered to have been in attendance even if he or she registered and totally withdrew from school during that semester/quarter as long as the official transcript so indicates. Any break in attendance of one calendar year or longer breaks a student's continuous attendance status. Once a student establishes catalog rights in the CSU or California Community College System, he/she may attend any accredited college or university not to exceed two years and maintain catalog rights. A planned educational leave maintains a student's continuous attendance status (see *Planned Educational Leave of Absence).*

Graduate (master's) students fulfill requirements based on an approved advancement to candidacy petition. These requirements are based on departmental and university requirements as published in the current catalog at the time of advancement. Continuous enrollment is likewise defined differently for master's students (see *Division of Graduate Studies and Research).*

Transcript Evaluation

Undergraduate transfer students are generally evaluated under the degree requirements listed in the *General Catalog* at the time they enter CSU, Fresno unless eligible for the 1980–81 or earlier catalog. This advanced standing evaluation is mailed to the student's mailing address sometime during the first semester of attendance assuming all transfer transcripts are on file.

* A student may not begin "continuous attendance" while still enrolled in high school.

Upon completion of approximately 90 semester units, students who have not received an advanced standing evaluation *should request* a senior evaluation from the Evaluations Office. This evaluation shows all requirements completed and any remaining baccalaureate degree requirements. Only one degree evaluation is made for each student. A degree evaluation is completed during the semester the student files for graduation (see *Graduation and Commencement).*

Each student should keep his or her personal copy current. All transcripts submitted in support of an application for admission become the property of the Records Office and are not returnable. Students are strongly encouraged to obtain duplicate copies of their records from high school and prior college attendance for their personal file. Students also are strongly encouraged to request a general education certification (partial or full) from the California community college and/or California State University campus that they attended prior to enrolling in CSU, Fresno. The certification should be requested at the time final college transcripts are requested.

Grade Symbols and Grade Points

A — Excellent. Performance of the student has demonstrated the highest level of competence, showing sustained superiority in meeting all stated course objectives and responsibilities and exhibiting a very high degree of intellectual initiative. (4 grade points per unit)

B — Very Good.[1] Performance of the student has demonstrated a high level of competence, showing sustained superiority in meeting all stated course objectives and responsibilities and exhibiting a high degree of intellectual initiative. (3 grade points per unit)

C — Satisfactory.[2] Performance of the student has demonstrated a satisfactory level of competence, showing an adequate level of understanding of course objectives, responsibilities and comprehension of course intent. (2 grade points per unit)

D — Unsatisfactory.[2, 3] Performance of the student has been unsatisfactory, showing inadequacy in meeting basic course objectives, responsibilities and comprehension of course content. (1 grade point per unit)

F — Failure. Fails to meet course objectives. Work at this level does not meet requirements for credit toward a degree. (0 grade points per unit)

U — Failure — Unauthorized Withdrawal.[4] The symbol *U* indicates that an enrolled student did not complete course requirements and did not properly withdraw from the course. It is assigned when, in the opinion of the instructor, completed assignments or course activities, or both were insufficient to make normal evaluation of academic performance possible. (0 grade points per unit)

CR — Credit for units allowed, work of *A, B* or *C* quality in undergraduate courses and *A* or *B* quality in 200-level courses. (0 grade points per unit; units allowed for the degree)

NC — No credit for units registered for, work of *D* or *F* quality in undergraduate courses and *C, D* or *F* quality in 200-level courses. Replaces *I* grade in courses where *CR/NC* grading is used if required work is not completed within required time. (0 grade points per unit; no units allowed)

W — Withdrawal after the fourth week of instruction. (Not used in grade point calculation.)

I — Incomplete. Semester requirements at least two-thirds complete with work of passing grade. (Not used in grade point calculation.) See *Incomplete Grade — Explanation,* which follows.

RD — Report delayed. Grade must be cleared before a degree is awarded. (Not used in grade point calculation.)

SP — Satisfactory progress — Continuing work in progress. (No units allowed and not included in grade point calculation until grade is assigned.)

AU — Audit. (Grade indicates student's status as auditor and does not earn degree credit.)

Notes:

[1] Master's degree candidates are reminded that a *B* (3.0) average is required in the master's degree program and for all courses (related and unrelated; lower division, upper division and graduate) taken concurrent with the master's degree program.

[2] Undergraduate students are reminded that a *C* (2.0) average is required for all college coursework completed, all courses taken at CSU, Fresno, and all courses in the major in order to graduate with a baccalaureate degree. Some majors are subject to more stringent grading requirements.

[3] Master's degree candidates are reminded that a *D* is not accepted toward any master's degree program.

[4] A *U* is assigned only for courses graded *A* through *F.* The course can be repeated and the new grade may be substituted for the *U* by petition, except for master's degree students. (See *Repeating Courses.)*

Explanation of Grades

Audit Status (AU). Persons wishing to attend classes without matriculating or receiving college credit may register as auditors. Auditors must register during the late registration period. Students enrolled in audit status only may not transfer to credit status without completing admission procedures. This must be done within the first two weeks of instruction.

Matriculated students may audit courses in addition to those in which they are registered for credit.

Enrollment in a course as an auditor shall be permitted only after students otherwise eligible to enroll on a credit basis have had an opportunity to do so. Auditors are subject to the same fee structure as credit students. Regular class attendance is expected and the student may be required to participate in any or all classroom activities at the discretion of the instructor. An audited course is not listed on the student's permanent record if the requirements for auditing the class are not met. A student who is enrolled for credit may not change to audit after the fourth week of instruction.

Credit for courses audited will not subsequently be granted on the basis of the audit. (See current *Schedule of Courses.*)

Credit/No Credit Grading (CR/NC). The credit/no credit grading policy at CSU, Fresno is designed to encourage academic exploration outside the major field of study. The policy also recognizes that in certain types of courses, student performance is best evaluated in terms of credit/no credit grading rather than through the traditional letter grades.

Neither the *CR* nor *NC* grade is included in the calculation of the grade point average. The grade of *CR* is assigned if the student's work is judged to be equivalent to an *A, B* or *C* grade as applicable to regular enrollment in an undergraduate course or equivalent to an *A* or *B* grade in a 200-level course.

The *NC* grade is assigned if the student's work is not equivalent to these standards.

1. General conditions and limitations:
   Some courses are not available for *CR/NC* grading, (See individual course description), while others are designated as available for *CR/NC* grading *only*. All other courses are available for *CR/NC* grading; however, a student may not enroll in more than 6 units of *CR/NC* graded coursework per semester. The decision to enroll for *CR/NC* grading must be made prior to the end of the fourth week of instruction and the decision must be recorded by the student at the Student Records Office.
2. Undergraduate Students:
   A student may not elect *CR/NC* graded coursework to satisfy requirements for the major unless the courses have been designated *CR/NC only*. A maximum of 24 semester units at CSU, Fresno of *CR/NC* evaluated credit, including all coursework taken *CR/NC only,* may be applied toward the degree.
3. Graduate Students:
   Credit for coursework earned through *CR/NC* in fall 1978 and in subsequent semesters may not be applied toward the master's degree unless the course has been designated as available for *CR/NC only* by the Graduate Council. A maximum of 6 units of *CR/NC only* credit may be applied to a 30-unit master's degree program and a maximum of 12 units of *CR/NC only* credit may be applied to a 60-unit program.

See the current *Schedule of Courses* for further information.

Incomplete (I). The symbol *I* (Incomplete Authorized) indicates that a portion of required coursework has not been completed and evaluated in the prescribed time period due to unforeseen, but fully justified, reasons and that there is still a possibility of earning credit. In order to be eligible for an *I* grade, the student must have completed at least two-thirds of the required coursework with a passing grade. It is the responsibility of the student to bring pertinent information to the attention of the instructor before the end of the semester and to determine from the instructor the remaining course requirements that must be satisfied to remove the Incomplete. A final grade is assigned when the work agreed upon has been completed and evaluated. Reregistration in the course is *not* used to remove an *I* grade.

Normally it is expected that the student will make up an *I* grade during the next semester; however, it must be made up within one calendar year immediately following the last day of the semester/session during which it was assigned. This limitation prevails whether or not the student maintains continuous enrollment.

Failure to complete the assigned work will result in the *I* being counted as a failing grade for grade point average computation. An *I* grade not made up within one calendar year after the grade has been recorded is changed to an *F* (or an *NC* if *CR/NC* grading was approved).

Incomplete grades must be cleared before a degree is awarded. In the absence of the instructor who has assigned the Incomplete, a student seeking to make up this grade should consult the department chair. A student may not be required to repeat a course in which an *I* grade was received unless he or she wishes to receive credit and the time for making up the grade has passed.

A short-term extension of time may be granted with justification by contacting the Office of the Registrar prior to the last day of the second semester/session.

Satisfactory Progress (*SP*). The *SP* symbol is used in connection with courses that extend beyond one academic term. It indicates that work in progress has been evaluated as satisfactory to date but that assignment of a final grade must await completion of additional work. The *SP* may be used only in courses designated on the approved *SP* grade course list published by the Office of the Vice President for Academic Affairs. Cumulative enrollment in units attempted may not exceed the total number applicable to the student's educational objective. As with an *I*, the student receiving an *SP* will have one year from the date of first enrollment to complete the work and to be awarded a final grade. Any extension of time limit for an undergraduate student's *SP* must receive prior authorization by the Office of the Registrar.

While completing work on an *SP*, graduate students are required to maintain continuous enrollment at CSUF. This may be accomplished through enrollment in "O" unit GS Continuation. Exception: Graduate students enrolled in Project 298 or Thesis 299 receive an *SP* at the end of the first semester of enrollment and are advised to complete work on the culminating experience during four additional semesters, subject to the five-year over-all time limit for completion of all master's degree requirements. In addition, if an *SP* in 298/299 is not replaced by a final grade within two years as recommended, the student's major department may require him/her to reregister for the course. (See *Graduate Studies and Research.*)

Since an *SP* is a type of incomplete grade, it must be replaced by a final grade in order for a student to graduate.

Unauthorized Withdrawal (U). The symbol *U* indicates that an enrolled student did not complete course requirements and did not properly withdraw from the course. It is used when, in the opinion of the instructor, completed assignments or course activities, or both were insufficient to make normal evaluation of academic performance possible. For purposes of grade point average computation this symbol is equivalent to an *F*. The *U* will not revert to any other grade.

Withdrawal (W). The *W* grade indicates that the student was permitted to drop the course after the fourth week of instruction for serious and compelling reasons with the approval of the instructor and appropriate campus officials. It carries no connotation of quality of student performance and is not used in calculating grade point average.

Grading Policies and Practices

Grading. Students are expected to complete all requirements for a class by the end of the semester unless an incomplete is permitted by the instructor in accordance with university policy. Students shall not be assigned additional work or be allowed to revise previous assignments in order to improve a final grade.

College Syllabus and Record Keeping. All faculty members shall provide students at the beginning of each semester a syllabus or outline stating course goals and objectives including grading methodology, types and number of projects, written assignments, tests, experiments, etc.

Repeating courses. Undergraduate students and postbaccalaureate students who are not enrolled in a master's degree program may repeat an undergraduate course at CSUF in which a grade of *D, F, U* or *I* was received. More specifically, only postbaccalaureate students pursuing **a)** a second baccalaureate degree, **b)** a second undergraduate

major, c) a teaching credential or d) who have no specific objective, are eligible to repeat courses for grade substitution. All units attempted will be used to determine the student's grade point average and graduation eligibility **unless** the student repeats the course and requests the new grade be substituted for the original grade. A grade substitution may be made only once for each course. Graduate-level (200-series) courses may not be repeated for the purpose of grade substitution.

The petition is approved if the student receives the same or higher grade than received for the previous attempt. If the petition is approved, units attempted, units passed (if any), and grade points from the previous attempt are deleted and are not used to compute grade point averages or graduation eligibility.

The petition is not approved if the student receives a grade lower than the previous grade (*U* or *F*). In such cases, no deletions are made and both grades are used in calculating the grade point average. In all cases, all work remains legible on the record to ensure a true and complete academic history.

A course completed at another institution may be repeated by enrolling in a regular CSUF course determined by the Evaluations Office to be essentially equivalent. A course which has been repeated successfully at another institution may not be repeated again for grade substitution at CSUF. In the case of a course repeated at another college, the policy of the college where the course was repeated shall be followed. If it is not possible to determine that policy, the CSUF policy will be followed.

If a student repeats a course in which the original grade earned was a *C/CR* or higher, the repetition is recorded on the student's transcript but will not be substituted for the original grade. Further, the units and grade points are included in the student's total units/grade points until deleted from these totals at the Advanced Standing evaluation or at the time of final evaluation for graduation.

Undergraduate students (first baccalaureate only) who received *D, F* or *U* grades at CSUF may repeat the same or equivalent classes at other accredited institutions with prior written departmental approval. Classes repeated under this policy shall be limited to no more than five lower-division classes. Concurrent enrollment shall not be permitted.

For further information, see the *Schedule of Courses* or the Grade Substitution form which is available at the Admissions/Records Office service windows, Joyal Administration Building.

Academic Renewal. Under certain circumstances, the university may disregard up to two semesters (three quarters) of previous undergraduate coursework taken at CSU, Fresno or at any other college from all considerations associated with requirements for the baccalaureate degree. When such action is approved, the student's permanent academic record is marked to indicate that *no* work taken during the disregarded term(s), even if satisfactory, may apply toward baccalaureate requirements. However, all work must remain legible on the record ensuring a true and complete academic history.

In order to qualify for renewal **all** of the following conditions must be met:

1. Five years must have elapsed since the most recent work to be disregarded was completed.
2. It must be evident that it would be necessary for the student to complete one or more additional terms in order to qualify for the baccalaureate degree if the request were not approved.
3. It must be evident that the poor level of work represented by the term(s) under consideration is not representative (see #4) of the student's usual academic performance and was due to extenuating circumstances.
4. Since the most recent work to be disregarded, the student must have completed in residence at CSU, Fresno, 15 semester units with at least a 3.0 GPA, or 30 semester units with at least a 2.5 GPA, or 45 semester units with at least a 2.0 GPA. Work completed at another institution cannot be used to satisfy this requirement.

Contact the Admissions Office, 278-2191, for further information or to apply for academic renewal.

Planned Educational Leave of Absence. A planned educational leave of absence is defined as a planned interruption or pause in a student's regular education during which the student temporarily ceases formal studies at CSU, Fresno, while pursuing other activities that may assist in clarifying the student's educational goals. The intent of the policy is to make it possible for a student to suspend his or her academic work and later resume studies with a minimum of procedural difficulty. A student who is approved for a planned leave will be considered a continuing CSU, Fresno student. A student may, therefore, enroll for classes at the end of an approved leave without reapplying for admission and may continue at CSU, Fresno without changing graduation requirements.

Planned educational leaves may be granted for a variety of reasons or projects, but certain characteristics must be contained in any request for a leave:

1. The student must have a definite objective, which in the judgment of the appropriate admissions official, contributes to his or her educational goals and objectives.
2. The request must be for a specific period of time which shall not exceed four consecutive semesters.
3. The student must plan to return to CSU, Fresno at the conclusion of his or her leave.

The following regulations apply to the planned educational leave:

1. A student currently enrolled in a fully-matriculated session may be considered for a planned educational leave.
2. A student may be granted only one leave as an undergraduate and one leave as a graduate student. Planned educational leaves are granted for up to four consecutive semesters.
3. Graduate students must be recommended by the dean of Graduate Studies; international students by the director of International Student Services and Programs; Educational Opportunity Program students by an EOP counselor.
4. Petitions for planned educational leaves must be filed (with the appropriate recommendation) at the Admissions Office before the first day of classes for the semester during which the leave is to begin.
5. Leaves are not approved for students in disqualified status or on contract to remove academic deficiencies.
6. It is expected that a student will devote his or her leave primarily to nonclassroom activities. A leave is not

approved if the student plans to attend another institution, unless the coursework the student seeks is not available at CSU, Fresno. Any academic credit earned while on a planned educational leave is accredited by CSU, Fresno only if permission is granted for that credit in advance by the admissions officer.

7. Students who do not return to the university at the conclusion of their planned educational leave and those who enroll elsewhere without permission of the admissions officer will be considered to have withdrawn from the university at the end of their last semester of regular enrollment at CSU, Fresno.

Students wishing to apply for a planned educational leave should obtain a request form from the admissions officer, Joyal 106, 278–2287.

Student Academic Petitions. The Student Academic Petitions Committee has the authority to permit exceptions to university baccalaureate degree requirements when fulfilling the degree requirement would prove to be an undue hardship for the student and/or such an exception can be demonstrated to be educationally justifiable. The committee will take action only upon the submission of a formal petition by the student that sets forth the facts and circumstances that may warrant special consideration. Petitions and procedural information are available in the Office of Advising and Orientation. The Petitions Committee does *not* make decisions pertaining to substitutions for undergraduate and graduate major requirements. Such requests are appropriately initiated through the student's department. Requests to waive established university policy governing graduate study may be addressed to the dean, Division of Graduate Studies and Research. If a request cannot be accommodated, it is forwarded to the Graduate Council.

The Student Academic Petitions Committee also has the responsibility of handling grade protests for all students, undergraduate and postbaccalaureate. If a student believes that he/she has been graded prejudicially or capriciously by an instructor, the student should consult first with the faculty member concerned within the first 15 working days of the following semester and make every effort to resolve the issue. (On many occasions when a student contacts an instructor about a grade thought to be assigned unfairly, the student learns that the instructor actually made a recording error, which is remedied when the instructor obtains a Grade Correction Request Form from the departmental secretary and submits the completed form to the Petitions Committee.)

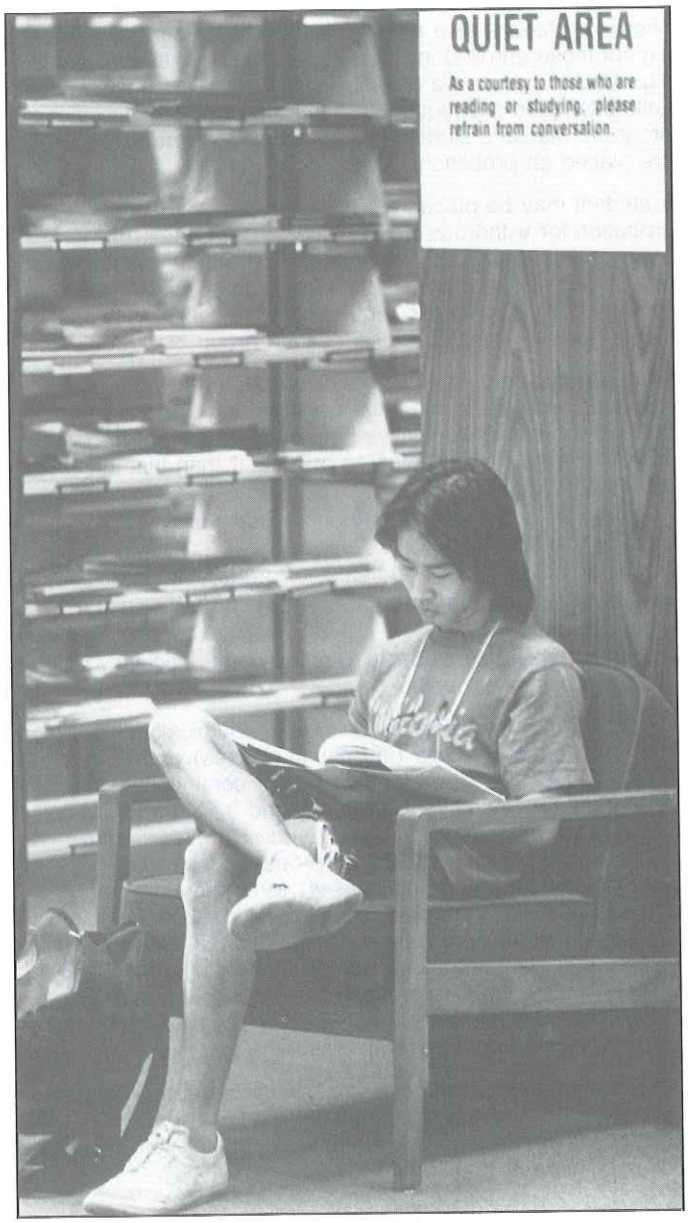
However, if the issue is not resolved, the student should then consult with the department chair. If the student still believes that the grade was assigned prejudicially or capriciously after completing this process, the student then may request that the Student Academic Petitions Committee review the issue. To request such a review, the student must submit no later than mid-semester a written statement setting forth all pertinent details to the director of advising and orientation, who chairs the Petitions Committee.

A full statement regarding "Protection Against Improper Academic Evaluation" and additional procedural instructions may be obtained from the Office of the Dean of Student Affairs. An associate dean of student affairs is available for clarification of grade protest procedures.

Scholarship Status

Satisfactory Scholarship. Satisfactory scholarship means at least a *C* average (2.0 grade point average or twice as many grade points as units attempted) and satisfactory progress toward a degree for undergraduate and post-baccalaureate students without a master's degree objective. Graduate (master's degree) students must maintain at least a *B* average.

A student (undergraduate, postbaccalaureate or graduate) whose grade point average falls below the satisfactory scholarship level is placed on probation and is disqualified if the grade point average falls below probation levels. (For details see below.) All probation and disqualification actions are recorded on the student's permanent record (transcript).



Probation. An undergraduate student is placed on academic probation, a type of academic warning, if his or her:

1. grade point average (GPA) based on total units attempted at all colleges is below a 2.0 (*C* average), or
2. GPA based on all units attempted at CSU, Fresno is below a 2.0 average.

The student remains on academic probation until both overall and CSU, Fresno grade point averages are 2.0 or better, or until the student is disqualified under one of the provisions of the disqualification regulations.

For example, a first semester freshman would be placed on probation if he/she carried 12 units (four 3-unit classes) and earned 1 *B*, 2 *C's* and 1 *F*. The student would then have to earn 3 *C's* and 1 *B* or better (in four 3-unit classes) the following semester to regain satisfactory scholarship status.

These regulations also apply to all postbaccalaureate students except those enrolled in master's programs. The latter are expected to maintain a cumulative GPA of at least 3.0. in all units attempted subsequent to admission to the master's program. Master's students who fall below the required GPA are placed on probation.

A student may be placed on administrative-academic probation for withdrawal from a substantial portion of a program in two successive terms or in any three terms; for repeated failure to progress toward a degree; or for failure to comply with an academic requirement or regulation that is routine for all students or for a defined group of students.

Disqualification. A student is disqualified if he/she is on probation and fails to meet the assigned scholarship contract or if he/she has a cumulative deficiency on either the overall or CSU, Fresno record equal to or greater than that indicated below.

- Freshmen, sophomores (0–59 units completed): 15 grade-point deficiency.
- Juniors (60–89 units completed): 9 grade-point deficiency.
- Seniors (90 or more units completed): 6 grade-point deficiency.
- Postbaccalaureate students: 6 grade-point deficiency on postbaccalaureate units.

For example, a new transfer junior is academically disqualified if he/she carried 12 units (four 3-unit classes) and earned 2 *Cs*, 1 *D* and 1 *F*. Upon readmission or continuation, the student then would have to earn 1 *B* and 3 *Cs* (in four 3-unit classes) the next semester to be removed from academic disqualification and be placed on probation, or 3 *Bs* and a *C* or better (in four 3-unit classes) to regain satisfactory scholarship status. The best way to regain satisfactory scholarship status is to repeat classes at CSU, Fresno in which the student previously earned *D, F* or *U* grades, and petition to have the new grade substituted for the prior grade. Disqualified students also are advised to not take heavy unit loads in attempting to bring up their GPA.

Graduate (master's) students are disqualified if their grade point average on either the overall or the CSU, Fresno postbaccalaureate record is equal to or greater than six grade points below a *B* (3.0) GPA.

A student who has been placed on administrative-academic probation may be disqualified for the following reasons:

1. If he or she fails to meet the conditions for removal of the probation.
2. Becomes subject to academic probation while on administrative-academic probation.
3. Or again becomes subject to administrative-academic probation for the same or similar reasons.

Readmission of Disqualified Students (Undergraduate). Students placed on disqualified status at the end of a fall semester are automatically readmitted the following spring semester on *probation contract*. This probation contract is indicated on the student's grade slip.

Students disqualified from CSU, Fresno at the end of a spring semester may be readmitted for a subsequent fall semester only by special action of the appropriate undergraduate authority. Readmission procedures are mailed to disqualified students at the time spring grades are mailed. A disqualified student, however, may enroll for summer session or extension classes without readmission approval.

Disqualified CSU, Fresno students who have been away one semester or longer must submit an application for readmission in addition to the appropriate petitions.

Contact the Admissions Office at (209) 278-2287 for further information.

Readmission of Disqualified Students (Postbaccalaureate/Graduate). Disqualified postbaccalaureate students who seek readmission must schedule an advisement interview in the Division of Graduate Studies, Thomas Administration Building, Room 132. Additionally, students who seek a master's, second baccalaureate or credential are asked to obtain the recommendation of the department/program to which they seek readmission. Students who are undeclared must have the approval of the dean of Graduate Studies in order to be readmitted to the university.

Transcripts and Reports

Transcript of Record. Students may request transcripts of their academic records at CSU, Fresno with the payment in advance of a $4 fee ($2 for each additional copy ordered at the same time). CSU, Fresno Extension transcripts must be requested separately. Because of the large number of transcripts requested at the end of each semester and summer session, three weeks should be allowed for requests to be filled during those periods. After the Admissions/Records Office has been notified of overdue student accounts, transcripts are not provided without clearance from the Business Office. Transcripts of record from other institutions submitted to this institution are not returned to the student.

Reports to Students. An enrollment report is made available to students by the Admissions/Records Office. At the end of the semester final grade reports are mailed to students at the address submitted to the Admissions/Records Office.

Classification of Students

Student class levels are determined as follows:

Freshmen — Students who have earned a total of fewer than 30 semester units.

Sophomores — Students who have earned a total of 30 to 59 semester units inclusive.

Juniors — Students who have earned a total of 60 to 89 semester units inclusive.

Seniors — Students who have earned 90 semester units or more.

Postbaccalaureate/Graduates — Students who have at least one bachelor's degree from an accredited institution.

Advanced Placement. The Advanced Placement Program of the College Entrance Examination Board permits able high school students to take college-equivalent courses while in high school and, based upon comprehensive qualifying examinations, receive advanced placement and credit at participating universities and colleges. CSU, Fresno grants credit toward its undergraduate degrees for successful completion of examinations of the Advanced Placement Program of the College Entrance Examination Board. Students who present scores of three or better are granted from three to six semester units of college credit for each examination. In order to receive credit for these examinations from CSU, Fresno, the student must present an official copy of the test results from the College Entrance Examination Board.

Credits earned through advanced placement are not included among the maximum of 30 units of credit by examination that may be credited toward a bachelor's degree.

The most commonly passed AP tests and equivalent courses are as follows:

Test	*Score*	*Units*	*Subjects*
American History	3,4,5	6	Hist 11, 12
Computer Science AB	3,4,5	6	C Sci 40*
English Lit/Comp	3,4,5	6**	Engl 1, 20
English Lang/Comp	3,4,5	6**	Engl 1, 2
Math Calc AB	3,4,5	6	Math 71, 72
Math Calc BC	3,4,5	6	Math 75, 76

* Remaining 2 units in lower-division Computer Science electives.

** If English Lit/Comp and English Lang/Comp are passed, then a maximum of 9 units is allowed for Engl 1, 2 and 20.

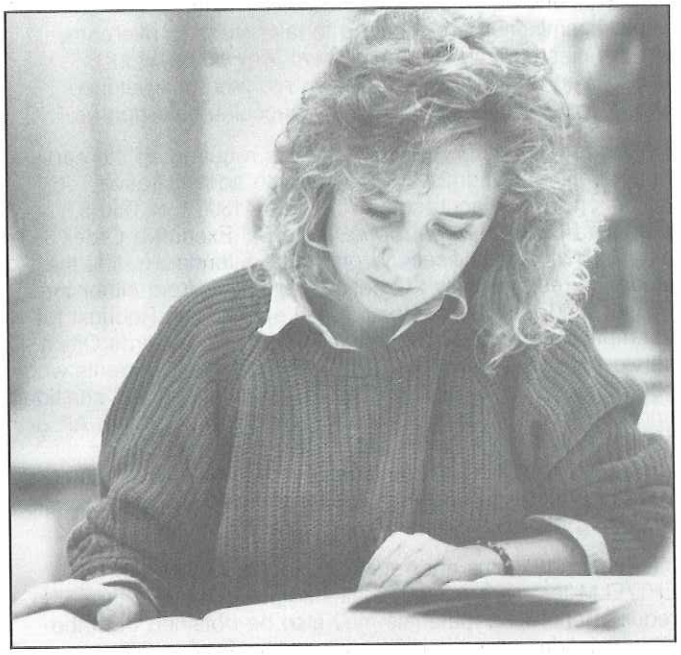
Official scores may be obtained from:

Advanced Placement Examination
Box 977-GPS-A
Princeton, NJ 08541

For more information, contact the Evaluations Office, Joyal Administration Building, Room 115.

English Placement Test (EPT). The CSU English Placement Test must be completed by all new undergraduates.* A passing score on the EPT is defined as earning a minimum

* Undergraduates admitted with 56 or more transferable semester units and who are subject to campus catalog or bulletin earlier than 1986–87 are not required to complete the EPT.



total score of 151 *or* a minimum essay score of 8. Exemptions from the test are given only to those students who present proof of one of the following:

- A score of 3, 4 or 5 on either the language and composition or the composition and literature examination of the College Board Advanced Placement Program.
- A score on the CSU English Equivalency Examination that qualifies a student for exemption from the English Placement Test.
- A score of 470 or above on the verbal section of the College Board Scholastic Aptitude Test (SAT–verbal).
- A score of 22 or above on the ACT English Usage Test.
- A score of 600 or above on the College Board Achievement Test in English Composition *with essay*.
- Completion of an acceptable college course in English composition of four quarter or three semester units with a grade of *C* or better.

Entry Level Mathematics (ELM) Test. All undergraduate students, except those eligible for a catalog prior to 1983–84, must take the ELM test and *pass it* before enrolling in a course that satisfies the quantitative reasoning requirement of the General Education CORE program. A passing score on the ELM is achieved by earning a minimum total score of 480. Exemptions from the test are given only to those students who can present proof of one of the following:

- A score of 3 or above on the College Board Advanced Placement mathematics examination *(AB* or *BC)*.
- A score of 530 or above on the mathematics section of the Scholastic Aptitude Test (SAT–math).
- A score of 23 or above on the ACT Mathematics Test.
- A score of 520 or above on the College Board Mathematics Achievement Test, Level 1.
- A score of 540 or above on the College Board Mathematics Achievement Test, Level 2.

- Completion of a college course with a grade of *C* or better that satisfies the General Education Breadth requirement in quantitative reasoning, provided it is at a level above intermediate algebra.*

Students who cannot demonstrate basic competence on either examination are required to take steps to overcome deficiencies early in their enrollment. Any coursework undertaken primarily to acquire the required competence shall not be applicable toward the baccalaureate degree.

Failure to take either of these tests, as required, at the earliest opportunity after admission may lead to administrative probation, which, according to Section 41300.1 of Title 5, *California Code of Regulations,* and CSU Executive Order 393, may lead to disqualification from future attendance. It is the students' responsibility to confirm exemption from either the EPT or ELM tests by completing the appropriate Request for Exemption Form available at the Admissions Records Office service windows, Joyal Administration Building. Students who need assistance in preparing for the ELM test should consider enrolling in one or more of the following classes: Math AR or Math ILR, N Sci 37, Psych 180T (overcoming academic anxiety). In addition, students may contact the Developmental Learning Resource Center in the Keats Building for information regarding ELM workshops.

Information bulletins and registration materials for the EPT/ELM tests are mailed to all students subject to the requirements. The materials may also be obtained from the Office of Admissions and Records or the Testing Office.

Credit by Examination. CSU, Fresno grants credit to those undergraduate students who pass examinations that have been approved for credit systemwide. These include the Advanced Placement Examinations, CSU English Equivalency Examination and some CLEP examinations.

Also, students may challenge courses by taking examinations developed at the campus. Credit shall be awarded to those who pass them successfully. Credit by examination is designed to encourage a regularly enrolled student to seek college credit in courses in which the student has competence but for which credit has not been earned by the usual academic processes, thereby permitting the student to accelerate his or her progress and provide an opportunity for wider selection of coursework. The following procedures should be followed:

1. With the concurrence of the department, a student may apply for credit by examination in any course in the current *CSU, Fresno General Catalog* for which he or she appears to be reasonably qualified by training or experience and for which college credit has not been previously allowed. Credit by examination is not awarded if credit has been granted for previous coursework more advanced than the level represented by the examination in question. Credit by examination is not allowed in a course in which the student has been permitted to register as an auditor during the same semester, in which the student has received a failing or no credit grade, or in which he or she has unsuccessfully sought credit by examination.
2. The student enrolls for credit by examination at any time during the first two weeks of classes. The student must be regularly enrolled in other courses before he or she is granted permission to earn credit by examination. Units of credit by examination are counted as part of the total units registered for a given semester or term. Applications for credit by examination should be completed by the student and approved by the department.
3. The examination must be administered by the end of the fourth week of instruction, and the instructor must report the grade prior to the close of the sixth week.
4. The course in which the student requests credit by examination is so designated on his or her record. If passed, the student receives a credit *(CR)* grade. If he or she is unsuccessful, no grade is reported. Units earned count toward all appropriate requirements but are not used in computing his or her grade point average.
5. The number of units earned by credit by examination in any semester or term may not exceed the number of units completed in regular enrollment. A maximum of 30 units earned by examination may be counted toward a bachelor's degree.

Credit earned by examination *does not meet the residence requirement of the university.* For further information, consult the department concerned. See also *Advanced Placement* in this catalog.

Graduate Students. Credit by examination for coursework may be used to fulfill prerequisites only and may not be applied toward the total units required for a master's degree.

Independent Study. Independent study is offered to give the student experience in planning and outlining a course of study on the student's own initiative under departmental supervision. Independent study should deal with a special interest not covered in a regular course or with the exploration in greater depth of a subject presented in a regular course. Each department has an independent study upper-division course (190), and some departments have a graduate level course (290). In some departments a 190 or 290 course may be desirable preparation for the thesis or other advanced study.

To be eligible for independent study, a student should have an overall grade point average of 3.0 or higher. This requirement may be waived in exceptional cases, when approved by the department chair. Maximum credit of 6 units is allowed toward the bachelor's degree in independent study courses, and maximum credit of 6 units is allowed in independent study courses toward the master's degree. Credit is limited to a maximum of 3 units per semester. Under extraordinary circumstances more than 3 units per semester may be allowed on petition to the department chair.

An eligible student desiring to register for a 190 or a 290 course must first obtain the consent of an instructor, who will guide the project, and the chair of the department in which the course is given. The student must register for 190 and 290 courses during the regular registration period in the same manner as he or she registers for any other course at the time of registration.

An independent study course normally includes an oral examination by a committee set up by the supervising instructor, a formal report that is filed in the department office, and an abstract of the study that is filed with the department chair. Approval forms and copies of the current regulations may be obtained from department or school offices. The entry on the permanent record shows the discipline and course number only; the title does not appear.

* Such courses taken in terms prior to Fall 1988 may be at the level of intermediate algebra or above.

Certain special regulations concerning enrollment in 190 and 290 courses during a summer session can be found in the *Summer Session Catalog*.

Credit for Noncollegiate Instruction. CSU, Fresno grants undergraduate degree credit for successful completion of noncollegiate instruction, either military or civilian, appropriate to the baccalaureate, that has been recommended by the Commission on Educational Credit and Credentials of the American Council on Education. The number of units allowed are those recommended in the *Guide to the Evaluation of Educational Experience in the Armed Services* and the *National Guide to Educational Credit for Training Programs.*

Credit for Military Service Course/Work. Lower-division elective credit is given for recruit training for initial entry into the service providing the student was on active duty for at least one year and one day. Credit given varies depending on the branch of service and date of entry. An applicant for credit must submit a copy of *Notice of Separation* (DD214) to the Evaluations Office.

DANTES (Defense Activity for Non-Traditional Educational Support) maintains the educational records of the service-men and women who have completed SST's (Subject Standardized Tests), CLEP (College Level Examination Program) examinations and GED tests. DANTES has also maintained USAFI (United States Armed Forces Institute) transcripts since that organization ceased to exist in 1974.

College credit is awarded for acceptable SST scores as recommended by DANTES. Equivalency for SST credit is determined by CSU, Fresno departments. Other credits recommended by DANTES (CLEP, etc.) must meet university guidelines for the awarding of credit for those examinations. DANTES/USAFI correspondence credit is combined with other extension or correspondence coursework to a maximum of 24 semester units.

Additional credit is granted for military courses as recommended in *A Guide to the Evaluation of Educational Experiences in the Armed Services.* The applicant for such credit must submit official documents giving all details such as location and length.

College Level Examination Program. The College Level Examination Program (CLEP) is designed to be a means through which recognition, academic credit and placement may be given for less conventional forms of educational experience. Those who may have reached a college level of education through home or correspondence study, on-the-job training, television courses or by other means may take the CLEP examinations, which are offered by the College Entrance Examination Board.

Within the restrictions of systemwide policy, CSU, Fresno awards credit for successfully completed CLEP examinations. Such credit is applied to the total units required for the baccalaureate degree, but it is not applied to the General Education requirement. Not all CLEP examinations are acceptable under system policy. Subject examinations may require the recommendation of the appropriate department before credit is awarded. Course equivalency is also determined by the department concerned.

Credits earned through CLEP are included among the maximum of 30 units of Credit by Examination that may be credited toward a bachelor's degree. For additional information, call the Office of Testing Services, (209) 278-2457.

My teachers and friends in the Journalism and English departments encouraged my writing and creativity, and my growing interest in the advertising field. Attending CSUF helped prepare me for the future. It opened my eyes to all the possibilities of the future — the new life that begins for us all after the last term paper is completed.

Christine A. Vartanian
Alumna from Las Vegas
Advertising Copywriter

English Equivalency Examination. The English Equivalency Examination (EEE) is an examination offered by the CSU system. It is administered each spring on the various campuses to prospective freshmen. Students passing both the objective and essay portions of the examination are granted six units of freshman English credit. For information, call the Office of Evaluations, CSU, Fresno, (209) 278-4076.

Credits earned through the EEE are included among the student's Credit by Examination (CBE) units. A maximum of 30 CBE units may be counted toward a bachelor's degree.

Students who want to challenge English 1 CBE may do so only by taking the EEE or the Advanced Placement (AP)–Language and Composition or AP–Literature and Composition tests. Although both tests normally are taken while a senior in high school, only the EEE also may be taken as a university student. Students who pass the EEE earn 6 units of CBE credit — 3 units in English 1 and 3 units in English 20. Students who pass AP–Language and Composition earn 3 units in English 1 and 3 units in English 2; whereas, students who pass AP–Literature and Composition earn 3 units in English 1 and 3 units in English 20.

Upper-Division Writing Examination. The Upper-Division Writing Examination (UDWE) is administered by the university and may be used to satisfy the upper-division writing skills requirement. One unit of credit may be granted (English 100W) to registered undergraduate students upon request. This unit may be applied toward the 40 upper-division unit degree requirement and total units for the baccalaureate degree but cannot be applied toward the 30 residence unit degree requirement or for postbaccalaureate credit. University registration deadlines must be adhered to. English 1 is a prerequisite to taking the UDWE. For details, call the Office of Testing Services, (209) 278-2457.

Baccalaureate Degree Requirements

A student must complete the following requirements in order to earn a Bachelor of Arts or Science degree. Requirements are described in detail in the latter part of this section. Most students accumulate a combination of units in the major, General Education and non-designated electives in order to fulfill the requirements of a baccalaureate degree.

1. A minimum of 124 semester units (most B.S. degree programs require 128 or more units).
2. An academic major.
3. General Education.
4. Specific course/skill requirements:
   a. English Composition (English 1 or equivalent).
   b. United States History (History 11 or 12).
   c. United States and California Constitution (Political Science 2 or 101).
   d. Upper-division writing skills.
5. A minimum of 30 residence units, of which 24 must be upper division and 12 in the major.
6. A minimum of 40 upper-division units.
7. Minimum of a *C* average for units in major, all CSU, Fresno units and total units.
8. Completion of an application for graduation obtained from the *Office of Evaluations* and payment of the graduation fee at the cashier's window in the Joyal Administration Building by one of the published deadlines.

Dual (Concurrent) Major Requirements

An undergraduate student may desire to complete the requirements for more than one major at the time of completion of the baccalaureate degree (i.e., graduate with a dual major). When the student applies for graduation, he or she must designate which major is to be the primary degree major for purposes of graduation. Minimum requirements and exceptions for dual majors are as follows:

- Dual B.A. majors must include 24 units, 12 of which must be upper-division.
- Dual B.S. majors must include 36 units, 18 of which must be upper-division.
- Courses in General Education may be used to fulfill secondary major requirements.
- Units may be double-counted for both majors above 24 mutually exclusive units (12 upper-division) in B.A. programs and 36 units (18 upper-division) in B.S. programs.

Special Major for the Bachelor of Arts Degree

The special major for a Bachelor of Arts degree provides an opportunity for students to engage in an individualized course of study leading to a degree when legitimate academic and professional goals are not accommodated by standard degree majors. The special major consists of correlated studies in two or more fields. It is not intended as a means of bypassing normal graduation requirements or a means by which students may graduate who fail to complete the degree major in which they are enrolled.



The special major must be approved in the Office of the Vice President for Academic Affairs, with approval based upon a case-by-case justification. The candidate must have one full year of academic work (at least 30 units) still to be completed to meet minimum degree requirements. The minimum requirement for the special major is an approved program of 45 units at least 30 units of which must be upper-division work. Units applied to General Education requirements may not be counted. Also, a maximum of 6 independent study units may be included in the special major program. Any exception to this limit must be approved in writing by the vice president for academic affairs upon written recommendation by the special major adviser prior to registration for the additional units.

A student requesting a special major must obtain application forms from the Office of Advising and Orientation. On these forms the student must: 1) Prepare a statement giving his or her reasons for desiring a special major in terms of academic and professional goals and why these goals cannot be met through a standard major; 2) Develop a specific list of courses which would, in his or her opinion, lead to the academic and professional goals stated above; 3) Secure the signed approval from the Office of Advising and Orientation, as well as from special major adviser and department chair in the areas from which the special major courses are drawn. The student must submit the foregoing material to the Office of the Vice President for Academic Affairs for final approval. Upon graduation, *Bachelor of Arts, Special Major* and the title of the special major will be entered upon the student's transcript and diploma.

Residence Requirements

The residence requirement for the baccalaureate degree specifies that 30 units shall be earned in residence at the campus granting the degree. Twenty-four of these units shall be earned in upper-division courses and 12 of the units shall be in the major. The residence requirement for graduate students is 21 units.

Extension credit and credit by evaluation, including credit by examination, may not be used to fulfill the above described requirements.

Specific Course/Skill Requirements

English Requirement. English 1, Composition, or its equivalent is a university graduation requirement that should be completed before the end of the fourth semester of university attendance. (A grade of *C* is the minimum acceptable grade to satisfy this requirement.) Students who are exceptionally well-prepared in composition may elect to satisfy the requirement by the successful challenge of English 1 or by successful performance in the *English Equivalence Examination (EEE)*. The English Placement Test does not substitute for English 1. See *English Placement Test* for test scores prerequisite to enrollment in English 1.

U.S. History and Government Requirements. Undergraduate and second baccalaureate degree candidates must demonstrate competence with respect to the Constitution of the United States, American history, and in the principles of state and local government of California in order to graduate. This may be done by passing examinations or by completing History 11 or 12 and Political Science 2 or 101. (In cases in which a student has completed the federal government requirement, Political Science 102 [1 unit] will fulfill the state and local government requirement.) (See *History Department — American History Requirement, and Political Science Department — United States Constitution Requirement, and General Education — CORE.)*

Upper-Division Writing Skills (UDWS) Requirement. All undergraduate and second baccalaureate degree candidates, must demonstrate competency in writing skills at the upper-division (junior-senior) level as a requirement for graduation. Students may meet this requirement in either of two ways after completion of 56 units:

1. Passing the Upper-Division Writing Examination (UDWE) composed of both an essay and an objective component. This examination is given several times each year, including once during the first two weeks of each semester. Students are permitted to take the examination a maximum of two times. Upon successful completion of the UDWE, an undergraduate student may request one unit of credit (Engl 100W), which may or may not be posted to the student's transcript the same semester in which the UDWE was passed. For details, call the Office of Testing Services, (209) 278-2457.
2. Obtaining a *C*, *CR* or higher grade in an approved upper-division course at CSU, Fresno. Approved courses can be identified in the catalog and *Schedule of Courses* by the letter *W* (e.g., Engl 160W, IS 105W). English Composition (Engl 1) is a prerequisite to any *W* course.

It is imperative that the UDWS requirement be met within one semester after completing 56 units, or no later than the second semester at CSU, Fresno for students transferring with 56 or more units. Also, the UDWS requirement cannot be fulfilled by a class or test taken outside of the California State University System.

Also, the UDWS requirement is not part of the General Education requirement. Passing the UDWE does not relieve a student from taking a *W* course if it is required in the major, e.g., Hist 100W.

Graduate students should consult *Graduate Studies and Research* regarding the graduate-level writing proficiency requirement.

Remedial Courses. Each student admitted to a CSU campus is expected to possess basic competence in the English language and mathematical computation. Students admitted who cannot demonstrate such basic competence are required to remedy this deficiency. Such remedial courses are designated by the letter *R* following the course number, except English A. Credits earned in remedial courses cannot be used to satisfy degree requirements. (See *Developmental Learning Resource Center.*)

Unit Limitations

The following unit limitations apply to all bachelor's degrees:

1. A maximum of 70 transferable semester (105 quarter) units is allowed from two-year institutions (community/junior colleges).
2. A maximum of 8 semester units of P.E./Dance Techniques/Athletics activity is allowed (P.E. and Dance majors may have credit for 12 semester units).
3. A maximum of 12 semester units is allowed for work experience/internship/agricultural projects. (A maximum of 6 semester units may transfer into the university. A maximum of 6 semester units of the 12 is allowed in

agricultural projects). All *work experience* and *internships* are graded on a credit/no credit basis. Normally, a maximum of 6 semester units of work experience/internship is allowed for credit toward a Business Administration major unless the business option specifically allows more units.

4. A maximum of 24 semester units at CSU, Fresno is allowed for *CR/NC* grading, excluding Credit by Examination. (See *Credit/No Credit Grading* for other limitations.)
5. A maximum of 30 semester units is allowed for Credit by Examination (excluding Credit for Advanced Placement Examination).
6. A maximum of 24 semester units is allowed for credit through Extension and/or correspondence coursework.
7. A maximum of 6 semester units is allowed for independent study coursework.
8. A maximum of 6 semester units is allowed for coursework in typing/keyboarding.

Second Baccalaureate Degree or Undergraduate Major Requirements

A postbaccalaureate student (i.e., one who already holds a bachelor's degree) may pursue a program leading to an additional baccalaureate *degree* or undergraduate *major*. Each student is urged to consult with a departmental adviser and with the Division of Graduate Studies and Research to determine whether a second baccalaureate or graduate program better meets his or her needs.

A. A postbaccalaureate student seeking an additional undergraduate *degree* must complete the following requirements:
   1. A minimum of 30 units in residence at CSU, Fresno since completion of the most recent degree.
   2. All state and university requirements for that degree, including English 1, General Education, United States Constitution and California state and local government, American history, and the upper division writing skills requirement. These requirements may be met by courses taken in the student's undergraduate program.
   3. All units required in the major. **No credit may be applied from courses taken for an earlier degree. If required major courses were previously taken, the student must substitute, with the approval of the department, additional major courses.** Graduate level courses (200 series) may not be applied toward the requirements for a second baccalaureate degree or additional undergraduate major.
   4. At least 12 units in the major in residence at CSU, Fresno since the last baccalaureate degree. Departments may set higher requirements.
   5. Filing of an undergraduate degree application and payment of graduation fee.

B. A postbaccalaureate student seeking an additional undergraduate *major* must complete numbers 3 and 4 above. The transcript will indicate that all coursework for the additional major has been completed. A student pursuing a second baccalaureate *degree* or additional undergraduate *major* cannot select the catalog or bulletin used for the initial undergraduate degree. If the student does not remain in continuous attendance, the requirements will be those in effect at the time the student re-enters the university or completes the program (see *Choice of Catalog*).

C. A postbaccalaureate student may not earn a minor or a second minor.

D. Second baccalaureate students are not considered for university honors.

Postbaccalaureate Credit. Upper-division and/or graduate level units earned at CSU, Fresno in the semester or summer session in which the bachelor's degree is granted are automatically listed on the student's permanent record as postbaccalaureate credit with the following exceptions:

1. Provided the courses are not needed for the bachelor's degree.
2. Provided the student is neither on academic probation nor academic disqualification at the beginning of the final term.
3. Units are not in excess of stated maximum limitations (e.g., six units of independent study).

In addition, only credit for courses in which grades *A*, *B*, *C* or *CR* are earned may be counted; no course may have its credit divided between baccalaureate and postbaccalaureate programs, and use of such credit for graduate degrees at CSU, Fresno requires special approval and is limited to a maximum of 10 units. (See *Graduate Studies and Research — Advancement to Candidacy.*) The amount of postbaccalaureate credit allowed may not exceed one-third of the required units for the master's degree. Only students with graduate standing may enroll in the following courses: 290, 298, 299. Use of postbaccalaureate credit for other purposes is to be determined by the appropriate authority.

Graduation

Students who anticipate meeting degree requirements by the end of a term should complete the following steps at the beginning of that term:

1. Obtain and file a completed application for a degree (with appropriate fees) with the Evaluations Office. See *Academic Calendar* for filing dates and deadlines. Failure to apply before the final deadline will delay the granting of the degree.
2. Request the Records Office public contact windows to transfer CSU, Fresno Extension units to the permanent record.

The Evaluations Office, considering the student's prior and current work, checks the student's application for a bachelor's degree against requirements and reports to the student regarding his or her eligibility for the degree. In the case of graduate degrees, this clearance is given by the graduate office. A degree is not awarded to a student with an *I* grade remaining on his or her record. A student receiving an *I* grade during the final year that has not been completed (or changed to an *F* grade) by the appropriate clearance deadline will not be considered for graduation that semester and must reapply for the degree. (See *Incomplete.*)

In order to be eligible for graduation, the student must:

1. Submit an application for the degree and pay the graduation fee.
2. Have been approved for graduation by the faculty.
3. Have met all financial obligations to the university.
4. Have completed with appropriate scholastic standing all courses required for the degree. Graduates receive their official diplomas by mail.

It is the responsibility of the student to be sure that all requirements have been met and that documentation has been filed with the Evaluations Office by the appropriate deadlines. No additions, deletions or changes to a student's record are permitted after the degree has been recorded.

Honors at Graduation. Honors at the time of graduation from CSU, Fresno are awarded to undergraduate students based on the following criteria:

1. The student must have an overall minimum grade point average of 3.5 on all work attempted.
2. The student must have a minimum grade point average of 3.5 on all work taken at CSU, Fresno.
3. The student must have completed 45 units in residence at CSU, Fresno.

The grade point average earned at CSU, Fresno determines which honors the student receives:

Summa Cum Laude (highest honors)	3.90 to 4.00
Magna Cum Laude (high honors)	3.70 to 3.89
Cum Laude (honors)	3.50 to 3.69

Since the requirement for honors could change, students are requested to check the current *General Catalog* for the criteria in effect at the time of graduation.

Commencement

Commencement is held annually at the end of spring semester. Students who have completed degree requirements in the summer or in the fall semester immediately preceding commencement are eligible to participate with those who complete their work in the spring semester. For additional information, see Kennel Bookstore and/or Dean of Student Affairs Office.

The Bachelor of Vocational Education Degree

The Bachelor of Vocational Education (B.V.E.D.) degree is limited to vocational teachers who qualify for a Swan Bill evaluation through the State Board of Vocational Examiners. Qualifications required for such an evaluation are outlined in the State Education Code. Among these qualifications is the stipulation that the candidate shall have had a minimum of 1,620 hours of teaching experience in an approved vocational class or 1,000 hours of teaching experience in an approved trade extension class. Additional information regarding this degree program may be obtained from the chair of the Department of Industrial Technology. B.V.E.D. students must complete all general requirements for the baccalaureate degree, except the 40 upper-division unit requirement.

Certificates

Many students want to study areas not covered by traditional degree programs to increase professional competence, to acquire paraprofessional training, to change careers or to promote personal enrichment. A baccalaureate or master's degree, or second baccalaureate or second major may be inappropriate for them, yet they may still deserve recognition for their work. To meet the needs of these students the university has established three kinds of certificates:

1. *The Certificate of Completion,* awarded for successfully completing a planned educational experience (workshop, conference, short course or seminar) designed for specific academic objectives.
2. *The Certificate of Special Study,* awarded for successfully completing a structured program of educational experiences, at least 12 semester units, determined in advance by a department or school, and consisting of upper-division (100–199) courses, professional (300–399) courses and related activities.
3. *The Certificate of Advanced Study,* awarded for successfully completing a structured program of at least 12 semester units of graduate (200–299) courses, upper-division (100–199) courses, and professional (300–399) courses, determined in advance by a department or school.

Public School Credentials

California State University, Fresno, is authorized by the Commission on Teacher Credentialing to recommend candidates for the following credentials. See *School of Education and Human Development* for program requirements.

Basic Teaching Credentials, Elementary

Multiple Subjects

Multiple Subjects, with emphasis in Early Childhood Education

Multiple Subjects, with emphasis in Bilingual/Cross-Cultural Education (Spanish)

Specialist Teaching Credentials

Agricultural
Bilingual/Cross-Cultural
Early Childhood
Reading
Resources
Special Education

Services Credentials

Administrative
Clinical-Rehabilitative
Pupil Personnel, including School Psychologist
Health (School Nurse)

Basic Teaching Credentials, Secondary

Single Subject:
- Agriculture
- Art
- Business
- English, with separate concentrations in Drama and Speech
- Foreign Languages
- Health Science
- Home Economics
- Industrial Arts
- Life Science (Biology)
- Mathematics
- Music
- Physical Education
- Physical Science (Chemistry)
- Physical Science (Physics)
- Social Science

Degree Programs, Majors and Minors

California State University, Fresno offers majors for the baccalaureate degrees, minors and master's degree programs as indicated below. Undergraduate options are indented under the programs. Requirements for approved undergraduate majors and minors, as well as graduate degrees, are listed in the appropriate school and department sections of this catalog. Graduate degree options are listed in the *Division of Graduate Studies and Research* section.

	Baccalaureate Degrees				Master's Degrees		
	B.A.	B.S.	Other	Minor	M.A.	M.S.	Other
Accountancy						X	
Aerospace Studies				X			
African-American Studies				X			
Agricultural Business		X		X		X	
Agricultural Education (B.S.) Agricultural Communications, Teacher Preparation		X					
Agricultural Science (B.S.) Option 1		X					
Agriculture				X		X	
Animal Sciences (B.S.) Basic Animal Science, Dairy Science, Meat Technology, Preveterinary Medicine, Production Management		X		X			
Anthropology	X			X			
Armenian Studies				X			
Art	X			X	X		
Asian Studies				X			
Asian-American Studies				X			
Biology (B.A.) Biological Science, Botany, Environmental Biology, Functional Biology, Microbiology, Zoology	X			X	X		
Business (General)				X		X	
Business Administration (B.S.) Accountancy, Agribusiness, Computer Applications and Systems, Decision Systems, Finance, Financial Services, Human Resource Management, Information Management, International Business, Legal Environment of Business, Logistics/Operations Management, Management, Marketing, Real Estate and Urban Land Economics, Risk Management and Insurance		X					M.B.A.
Chemistry	X	X		X		X	
Chicano/Latino Studies				X			
Child Development		X					
City and Regional Planning							M.C.R.P.
Classical Studies				X			
Communicative Disorders	X			X	X		
Computer Science		X		X			
Counseling						X	
Criminology (B.S.) Corrections, Law Enforcement		X		X		X	
Economics	X			X			
Education					X		
Engineering, Civil		X				X	
Engineering, Computer		X					
Engineering, Electrical		X					
Engineering, Industrial		X					
Engineering, Mechanical		X					
Engineering, Surveying		X					
English	X			X	X		
Ethnic Studies				X			
Food and Nutritional Sciences (B.S.) Dietetics and Food Administration, Enology, Food Science, Food Systems Management, Sports Nutrition		X		X			
French	X			X			
Geography	X			X	X		
Geology		X		X		X	
German	X			X			
Gerontology				X			
Health Science (B.S.) Health Science — Community Health, Environmental Health Science, Health Services, Occupational Safety and Health		X		X		X	
History	X			X	X		

	Baccalaureate Degrees			Minor	Master's Degrees		
	B.A.	B.S.	Other		M.A.	M.S.	Other
Home Economics	X			X		X	
Humanities Interdisciplinary Minor				X			
Industrial Arts (B.A.) Graphic Design	X			X	X		
Industrial Technology (B.S.) Manufacturing Industries, Construction		X					
International Relations					X		
Interior Design	X						
Journalism Advertising, News-Editorial, Photocommunication (see Mass Communication M.A.), Public Relations, R-TV News Communication	X			X			
Latin				X			
Latin American Studies				X			
Liberal Studies Credential, Non-Credential	X						
Linguistics (B.A.) English as a Second Language, Spanish-English Bilingualism	X			X	X		
Marine Sciences						X	
Mass Communication					X		
Mathematics	X			X	X	X	
Microbiology		X					
Military Science				X			
Music (B.A.) Options I, II	X			X	X		
Nursing		X				X	
Peace and Conflict Studies				X			
Philosophy (B.A.) Prelaw, Religious Studies	X			X			
Physical Education (B.S.) Adapted Phys. Ed., Allied Career, Athletic Training, Teaching		X		X	X		
Physical Science				X			
Physical Therapy		X					
Physics	X	X		X	X	X	
Plant Science (B.S.) Crop Science (Agronomy and Vegetable Crops), Ornamental Horticulture, Plant Protection, Soils/Irrigation, Viticulture/Tree Fruit		X		X		X	
Political Science	X			X			
Psychology	X			X	X	X	
Public Administration	X			X			M.P.A.
Recreation Administration (B.S.) Commercial, General (Public-Private), Therapeutic		X		X			
Rehabilitation Counseling						X	
Russian	X			X			
Russian Area Studies				X			
Social Science	X						
Social Work	X						M.S.W.
Sociology	X			X			
Spanish	X			X	X		
Special Education					X		
Special Major	X				X		
Speech					X		
Speech Communication	X			X			
Telecommunications (B.A.) Creative, Management, News/Public Affairs, Production (see Mass Communication M.A. degrees)	X			X			
Theatre Arts (B.A.) Dance (see Speech M.A.)	X			X			
Vocational Arts			B.V.E.D.				
Urban Studies				X			
Women's Studies				X			

Developed by both faculty and students, CSU, Fresno's General Education Program is an introduction to the breadth and depth of the dynamics of human experience. It provides students with a foundation in the liberal arts and sciences and prepares them for specialized study in a particular discipline or program.

The overall objective of General Education is to create a context wherein basic skills are developed and strengthened, scholarship and disciplined thinking emerge, awareness and reflection occur, and ultimately — the *integration* of knowledge begins.

CORE, BREADTH and CAPSTONE

The General Education Program is an integrated curriculum of courses organized into three phases:

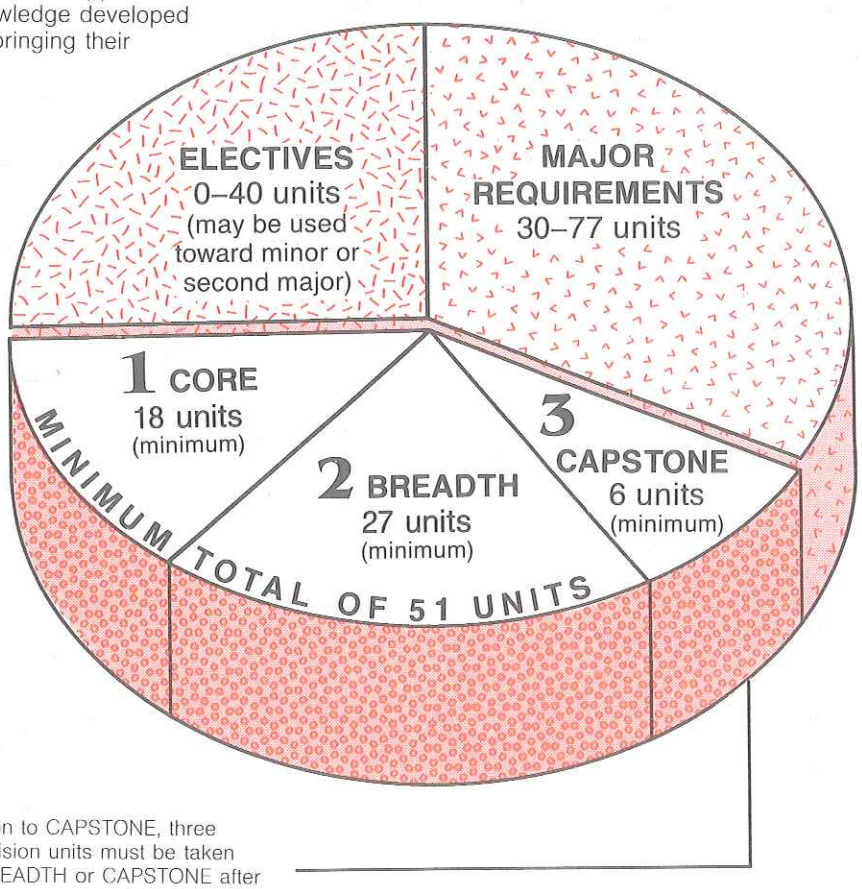
CORE, the basic foundation of one's university education, consists of courses in fundamental skills and knowledge.
BREADTH exposes students to a variety of disciplines within a structured framework that develops knowledge and skill representative of all areas of human endeavor.
CAPSTONE concludes the General Education Program by providing an interdisciplinary experience at the upper-division level in which the skills and knowledge developed in CORE and BREADTH are integrated, bringing their interrelationships into focus.

Requirements

The General Education Program requires students to complete a minimum of 51 semester units. This includes 18 units minimum in CORE, 27 units minimum in BREADTH and 9 upper-division units minimum, of which 6 units are in CAPSTONE. The 9 upper-division units can be taken only after completing 56 units of coursework. Also, 9 units must be taken in residence at CSU, Fresno.

Because the goal of General Education is to provide a solid foundation with a broad scope and the goal of the major is to provide depth in a specific discipline or program, the following stipulations apply:

1. A CORE course also may be applied to a student's major requirement unless the department specifically prohibits it.
2. A maximum of two General Education courses from one department or program may be applied to satisfy BREADTH requirements. (However, a department or program may prohibit any General Education BREADTH course from simultaneously satisfying its own departmental or programmatic requirements.)
3. Courses used to satisfy CAPSTONE may not be used to satisfy requirements for the major.



Note: In addition to CAPSTONE, three more upper-division units must be taken from CORE, BREADTH or CAPSTONE after completing 56 units.

CORE

An educated person must be able to read critically, communicate effectively and think clearly. CORE serves to develop these skills. It is important to take CORE courses soon after entry into the university.

Select one course from each of the following six categories for a minimum of 18 units:

1. English 1
2. Speech 3, 7, or 8
3. Quantitative Reasoning:
   - Mathematics: Decision Sciences 71; Mathematics 45, 70, 72, 75
   - Computer Language: Computer Science 20, 40; Electrical and Computer Engineering 70, 71
   - Statistics: Agricultural Economics 71; Health Science 92; Mathematics 11; Plant Science 99; Psychology 42
4. Critical Thinking:
   Anthropology 30; Computer Science 1; English 21, 30, 44; Foreign Language 10; Greek 10; Natural Science 4; Philosophy 25, 26, 27, 45; Sociology 3; Speech 5; Surveying Engineering 5
5. History 11 or 12
6. Political Science 2 or 101

BREADTH

The BREADTH component of the General Education Program exposes students to a variety of disciplines within the structured framework of Divisions 1–9.

Select one course each from Divisions 1–9 for a minimum of 27 units. Courses from Divisions 1 and 2 must have a laboratory component.

Division 1 — Physical Processes

Purpose: To understand fundamental principles in the physical sciences and the methods of developing and testing hypotheses used in the analysis of the physical universe.

Chemistry 1, 1A, 1B, 3A, 3B
Geology 1, 2, 15 (Man and the Natural Environment only)*
Physical Science 21
Physics 2A, 2B, 5A, 5B, 10

Note: *Math 4R or second-year high school algebra is a prerequisite for all courses in Division 1.*

Division 2 — Biological Processes

Purpose: To understand basic concepts of living things, the nature of scientific knowledge, and the relevance of biological knowledge to human affairs.

Biology 10, 15 (Man and the Natural Environment only)*
Botany 1 or 10
Zoology 1 or 10

Division 3 — Behavioral/Environmental Systems

Purpose: To understand scientific concepts of human development and the relationships between people and their physical environment.

Anthropology 1, 3
Geography 5, 7
Plant Science 105
Psychology 10, 36

* Man and the Natural Environment (MNE) is a 17-unit interdisciplinary thematic cluster offered through the School of Natural Sciences. For more information about this program, see *School of Natural Sciences.*

Division 4 — Personal Life and Growth

Purpose: To equip human beings for lifelong understanding of themselves as integrated physical and psychological entities and to enhance their appreciation of and participation in the social, cultural and physical environment.

Art 13, 20, 30, 40, 50, 60, 70
Child and Family Studies 38
Dance 116
Drama 22, 34
English 41, 43
Food Science and Nutrition 53
Health Science 90, 124
Industrial Engineering 125
Music 2-102, 3-103, 18-118, 21-121
Physical Education 31
Psychology 61, 132, 171
Recreation 80, 101
Speech 4

Division 5 — Fine Arts

Purpose: To understand the world of nonverbal expression by developing an appreciation for the integrity and harmony of works of art.

Art 1
Art History 10, 11
Chicano and Latin American Studies 7, 9
Dance 171
Drama 62, 163
Music 9, 74

Division 6 — Humanities and Literature

Purpose: To understand, appreciate and analyze the meaning of our civilization and its cultural and historical background and to study the realm of literature from a variety of historical perspectives and cultures by analyzing individual works.

Applied Ethics 100
Armenian 148
English 20, 101, 102, 103
French 109, 148
German 148
Greek 148
History 1, 2
Humanities 10, 11, 12
Philosophy 1, 10, 120, 131
Russian 148
Spanish 140, 142, 146

Division 7 — Languages

Purpose: To understand the nature and role of language by developing skills in speaking, reading and writing a language other than English.

Students from non-English speaking countries cannot use their native language for General Education BREADTH, Division 7.

Armenian 1A, 1B, 2A, 2B
Chinese 1A, 1B, 2A, 2B
French 1A, 1B, 2A, 2B
German 1A, 1B, 2A, 2B
Greek 1A, 1B, 3A, 3B
Hebrew 1A, 1B
Italian 1A, 1B, 2A, 2B
Japanese 1A, 1B, 2A, 2B
Latin 1A, 1B
Linguistics 10

Portuguese 1A, 1B
Russian 1A, 1B, 2A, 2B
Sanskrit 10A, 10B
Spanish 1A, 1B, 2A, 2B, 4A, 4B

Division 8 — Social, Economic and Political Systems

Purpose: To understand and analyze the basic principles underlying human social behavior.

Agricultural Economics 1
Anthropology 2, 15 (Man and the Natural Environment only) *
Economics 25, 40, 50
Geography 2, 3, 4
Political Science 1, 8, 120
Sociology 1, 2

Division 9 — Other Cultures and Women's Studies

Purpose: To understand the diversities and similarities of individuals and groups by studying the roles of specific ethnic cultures and women in contemporary America.

African-American Studies 25, 27, 38, 144
Armenian Studies 10
Asian-American Studies 15, 30, 56
Chicano and Latin American Studies 3, 5, 160
Ethnic Studies 1
History 101
Native American Studies 50, 103
Sociology 131
Women's Studies 10, 101, 131, 135

* Man and the Natural Environment (MNE) is a 17-unit interdisciplinary thematic cluster offered through the School of Natural Sciences. For more information about this program, see *School of Natural Sciences.*

CAPSTONE *(Upper Division)*

CAPSTONE provides an interdisciplinary experience at the *upper-division level* in which the skills and knowledge developed in CORE and BREADTH are integrated.

Policies for CAPSTONE

The CAPSTONE requirement may be fulfilled in one of two ways — either by completing a minimum of 6 units (two courses) in specific interdisciplinary courses (IntD and/or IntD ____Nex) or by completing a minimum of 6 units (two courses) in a single cluster from two different departments or programs, after 56 units have been completed.

A student must take at least one upper-division Critical Thinking (CT) course not listed in CORE or BREADTH in order to graduate.

No CAPSTONE course may be used to fulfill a requirement toward an undergraduate major or a master's degree.

All CAPSTONE courses require a written paper, research project, or performance equivalent exploring the course or *Cluster* theme.

In the case of *Cluster* courses, the student must select from at least two different participating departments.



CAPSTONE: *Interdisciplinary Courses (IntD)*

IntD 101Nex. Space and Time (3). An interdisciplinary study of the changing concepts of space and time that underlie our vision of the world and the ways in which these concepts are expressed, especially in art, astronomy, literature and physics. (Former Nexus 101)

IntD 102Nex. Understanding of Men and Women (3). A philosophical, psychological and biological investigation of the main issues involved in understanding human behavior. Reading and discussion of literary and historical accounts of behavior, with emphasis on the development of scientific explanation. Ethical scientific consequences of the use of experimental methods. (CT) (Former Nexus 102)

IntD 103Nex. Ascent of Man (3). Exploration of basic ideas found in Jacob Bronowski's *Ascent of Man.* The course explores the implications, both scientific and humanistic, of Bronowski's interpretation of man's cultural history. Guest lecturers from various arts and science disciplines add their insights. (Former Nexus 103)

IntD 104. Humanities in the Middle Ages and Renaissance (3). An examination of art, literature, philosophy, and music and their interrelationships in European culture during the Middle Ages and Renaissance. (CT) (Former CapS 104)

IntD 104Nex. Psychological Issues Through Literature (3). Examination of fundamental and controversial issues in psychology as they appear in novels, plays and short stories. (Former Nexus 104)

IntD 105Nex. Evolution Revolution (3). An exploration of the significance of evolutionary theory and its impact on the sciences and on the broader cultural scene: Pre-Darwinian evolutionists; changing attitudes toward persons and their relation to the rest of nature; literary and artistic expressions of evolutionary ideas; philosophical and ethical responses; the controversies between evolutionary and other accounts of the origin and development of life. (Former Nexus 105)

IntD 108. Humanities in the Ancient World (3). An examination of art, literature, philosophy, and music and their interrelationships in the Ancient world (Sumer, Babylonia, Ancient Egypt, Ancient Greece). (CT) (Former CapS 108)

IntD 112. Humanities During the Baroque and Enlightenment (3). An examination of European and American art, literature, philosophy, and music and their interrelationships during the period from the late 16th century through the 18th century. (Former CapS 112)

IntD 116. Humanities in the Modern World (3). An examination of art, literature, philosophy, and music and their interrelationships in the Western world during the 19th and 20th centuries. (CT) (Former CapS 116)

IntD 120A–B. Latin America: A Search for Stability (3–3). Prerequisite: completion of Division 8 of the General Education Program or permission of the instructor. An examination of the geographic, social and historical factors underlying government instability in Latin America followed by a discussion of right and left wing approaches to stability. *Completion of both semesters is required to satisfy the* CAPSTONE *requirement for General Education.* (Former CapS 120A–B)

IntD 123. The American Experience: Beginnings to World War I (3). Survey of the principal experiences and intellectual movements that have formed the American character, as illustrated through American literature, music, and the arts, serious and popular, from the formation of the colonies to the outbreak of WWI. (Former Hum 120, CapS 123)

IntD 124. The American Experience: World War I to the Present (3). Survey of the principal experiences and intellectual movements that have formed the American character, as illustrated through American literature, music, and the arts, serious and popular, from WWI to the present time. (CT) (Former CapS 124)

IntD 128. Mythology: An Interdisciplinary Approach (4). An interdisciplinary examination of mythology. Readings in significant myths from various parts of the world (including those influential on Western culture, such as Greek myth and the Bible, and equivalent Native American, Pre-Columbian, Oriental, and African myth). A survey of the current theories of myth (as a component in ritual and religion, a development of linguistics and oral tradition, a focus of cultural values, and the like); and an examination of the contemporary relevance of myth in art, literature, and culture. (Former CapS 128)

IntD 130. Latin American Cultures and Traditions (3). A study of Hispanic cultural and aesthetic trends and practices as seen in the popular and formal arts and other styles of Hispanic thought, feeling, and expression. (Former Hum 130, CapS 130)

IntD 132. Aging as a Social Issue (3). Prerequisites: English 1 and prior fulfillment of upper division writing skills requirement. An examination of human aging from the viewpoints of gerontology, literature, and social work with particular emphasis on the problems of women. (CT) (Former CapS 132)

IntD 144. The Individual and Complex Organizations in American Society (3). An examination of the characteristics and complexities of professional organizations. Designed to develop knowledge of fundamental organizational theory, of the function of such organizations, and of the methods by which administrative structures and processes interact with external environments and clients. (Former CapS 144)

IntD 148. Voting and Elections in the Nineteen Eighties (3). Exploration of the factors (e.g., socio-economic, cultural, peer and family influences) that affect voting. Focus of class is on the analysis of major election studies. (Former CapS 148)

IntD 152. Ethnic Minorities in American Schools (3). Exploration of the socio-historical and cultural development of education in the United States, with special emphasis on the Asian-American, American Indian, African-American and Chicano experience. (CT) (Former CapS 152)

IntD 156. Welfare and Military Expenditures: The Quest for Balance (3). An examination of the size and effects of spending for social welfare and military purpose. (Former CapS 156)

IntD 160. Orientation to Gerontology (3). Orientation to the professional and personal requirements for work with the aging, including an introduction to the problems and potentials of the aged. (CT) (Former CapS 160)

IntD 164. Technology and Health Care (3). The impact of technology on the health care industry: current applications, resulting ethical issues, political ramifications and future directions. (Former CapS 164)

IntD 168. Cinema and the Humanities (3). Explores the relationships between the art and technology of the cinema and current humanist ideology. Topics include how film interacts with other arts and with cultural, aesthetic, and moral assumptions; whether cinema is a viable intellectual discipline; and where art, entertainment, and values meet. Weekly films, assigned reading, written reports. (CT) (Former CapS 168)

IntD 172A–B. Health Promotion and Wellness (3–3). Prerequisite: upper-division status. An interdisciplinary approach to encourage individual responsibility toward achieving high level wellness with integration of body, mind, and spirit. To assist students in seeking balance with their natural and psychosocial environments. (2 hours lecture, 2 hours lab) IntD 172A is a prerequisite to IntD 172B and both *A* and *B* must be completed to receive CAPSTONE credit. (Former CapS 172A–B)

IntD 176. San Joaquin Valley Dream (3). An overview of the social, economic and cultural development of the San Joaquin Valley with special attention to ethnic minorities and the mass media. (Former CapS 176)

IntD 180. Peace and Conflict (3). Provides an overview of causes and types of conflict, issues related to war, peace and justice; historical and contemporary perspectives and responses to conflict resolution; uses an eclectic and interdisciplinary approach. (CT) (Former CapS 180)

IntD 184. Family Communication (3). The analysis and exploration of personal experience, family systems theory and the mass media to describe, evaluate and improve family communication patterns. Special topics include family conflict, sex roles, family types, sexual communication, parenting and intimacy.

IntD 188. Principles of Self-Esteem in Education, Social Work and Mental Health (3). Involves an empirical exploration of the development, enhancement, and diminishment of self-esteem through social experience and the relationship of self-esteem to a variety of social problems and concerns. The course focuses on the personal development of self-esteem and on specific applications of this theory domain to policy and practice in the fields of education, social work and mental health. (CT)

CAPSTONE: *Cluster Courses*

The Spiritual Quest

Cluster Theme: To explore in cross-cultural, theoretical, and philosophical perspectives the answers humans have discovered to ultimate questions.

Anth 150W	Anthropology of Religion (3) (CT)
Phil 130	Philosophy of Religion (3) (CT)

Energy and Society

Cluster Theme: To understand the role of energy in modern society and to provide an awareness of environmental problems associated with energy utilization from an economic, spatial, practical, and theoretical standpoint.

Econ 117	Economics of Ecology (3) (CT)
Geog 134	Geography of Energy (3) (CT)
I T 106	Energy Conversion and Utilization (3)
P Sci 168	Environmental Impact of Energy Demands by Society (3) (CT)

Ethnicity and Culture: Theories and Applications

Cluster Theme: To sharpen the focus on ethnic behavior by applying theories of inter-ethnic contact, boundary maintenance, and cultural change to the study of one major element, folklore, in the culture of a significant ethnic minority group in the United States today.

Anth 172	Ethnic Relations and Cultures (3) (CT)
CLS 103	Chicano Folklore (3) (CT)

Christianity, History and Politics

Cluster Theme: To offer students an opportunity to reflect upon and integrate their General Education experience in the light of the tradition of Christian humanism. To offer a framework and a method for tying together the disparate bodies of information and insight garnered from formal courses in the humanities, the arts, and the natural and social sciences.

Hist 103A	History of Early Christianity (3)
Pl Si 112	Politics and Christianity (3) (Same as A Eth 104)

The Church and the Court

Cluster Theme: To explore the interdependence of art forms developed during the Middle Ages and the Renaissance in Western Europe.

Art H 122	Northern Renaissance (3)
Engl 113	World Literature: Medieval and Renaissance (4) (CT)

Mexico-U.S. Relations: Conflict and Change

Cluster Theme: To explore the constant conflicts and changes in Mexican/U.S. relations from the past to the present and to analyze the socio-cultural interaction among Mexicanos/Chicanos and Anglos.

CLS 114	Mexico and the Southwest 1810–1910 (3) **or**
CLS 115	Mexico-U.S. Relations Since 1910 (3) **and either**
Hist 165	Modern Mexico (3) **or**
Hist 183	The Hispanic Southwest (3)

The Greek World

Cluster Theme: To deal with the ancient, primarily Greek, world from its earliest beginnings to the classical period and beyond.

Engl 112	World Literature: Ancient (4) (CT) **and either**
Hist 111	Ancient Greece (3) **or**
Phil 101	Ancient Philosophy (3) (CT)

Popular Culture and Society

Cluster Theme: To examine popular culture as an institution that is organized in distinctive ways; the relation between content and social structure; the importance of the content of popular culture in shaping society.

Engl 174	Popular Fiction (3) **or**
Music 187	Pop Music: Jazz and Rock (3) **and either**
Soc 142	Sociology of Popular Culture (3) (CT) **or**
TCOM 163	Radio-TV as Popular Culture (3) (CT)

Agriculture and Government Policy

Cluster Theme: To investigate the philosophical foundations, political formulation, and economic consequences of government agricultural policies and farm programs.

Ag Ec 150	Agricultural Policy (3) (CT) **and either**
Phil 125	Issues in Political Philosophy (3) (CT) **or**
Pl Si 150	Public Policy Making (3)

The Soviet Union

Cluster Theme: To acquaint students with the geography, history, economy, institutions, and culture of the Soviet Union.

Geog 176	Geography of the U.S.S.R. (3)
Hist 143	The Soviet Union (3) (CT)
Pl Si 141	Soviet Politics (3)

Business and Society

Cluster Theme: To understand the relationship between business and society and to analyze various forms of business activity that have appeared in different societies and at different times.

B A 120	Business and Society (3)
Soc 149	Sociology of Business (3) (CT)

The Roman World

Cluster Theme: To acquaint students with Roman civilization in the areas of language, law, government, art, architecture, literature, and religion.

Hist 112	Ancient Rome (3)
Latin 148	Roman Literature in English Translation (3) (CT)
Phil 108	Roman Philosophy (3) (CT)

Crime and Society

Cluster Theme: To provide students an opportunity to study crime in contemporary American society from an intensive interdisciplinary approach.

Crim 100	Criminology (3) (CT) **or**
Crim 153	Psychology of Crime (3) (CT) **and either**
Soc 143	Deviance and Control (3) (CT) **or**
Soc 159	Social History of Crime (3) (CT)

Women: Themes and Variations; Potential and Problems; Cohesion and Conflict

Cluster Theme: To re-orient the student from a perception of women as "other" to a view of all women as equal contributors to our developing humanity and increase sensitivity to the problems that women — privileged and oppressed, African-American and Chicana, working and at leisure — have faced, coped with, and surmounted to achieve selfhood.

Af Am 137	African-American Women (3) (Same as W S 137)
Anth 170	Women: Culture and Biology (3) (CT) (Same as W S 170)
CLS 152	The Chicano Family (3) (Same as W S 152)

Note: To receive CAPSTONE *credit, a student must complete Anth 170 before Af Am 137 or CLS 152 is taken.*

The Renaissance

Cluster Theme: The emergence of the "modern world" from its medieval beginnings to the 17th century.

Art H 120	Italian Renaissance (3) (CT)
Engl 147	Renaissance (4) (CT)
Hist 125	Renaissance (3)
Music 161A	Survey of Music History I (3)

The World of the Old Testament

Cluster Theme: An analysis of the Hebraic world, including its history, geography, literature, and its basic religious beliefs.

Hist 115	Ancient Israel (3)
Geog 180	Biblical Lands (3)
Phil 134	Literature of the Old Testament (4) (Same as Engl 116)

European Culture Since the Renaissance

Cluster Theme: The various ways in which intellectual and artistic movements and political ideologies have shaped the development of the modern world from the 18th Century to the present.

Engl 114	World Literature: Modern (4) (CT)
Hist 135	European Cultural History (3) (CT)
Music 161B	Survey of Music History II (3)
Phil 103	Bacon to Kant (3) (CT)

Note: To receive CAPSTONE *credit, a student must complete Hist 135 before Engl 114, Phil 103, or Music 161B is taken.*

California: Land of Contrast

Cluster Theme: An examination of the physical, cultural and political complexities of the state of California; a land of contrast.

Geog 168	Geography of California (3) (CT)
Geol 168	Geology of California (3)
Pl Si 103	California Politics (3)

Note: To receive CAPSTONE *credit, a student must include Geog 168 as part of the required 6-unit cluster.*

Cities and Urban Society

Cluster Theme: To explore the social, economic and environmental factors at work in the formation of cities; their changing forms and social patterns; urban life and interrelationships; means for guiding city change through planning.

Anth 108	Urban Anthropology (3) (CT)
C R P 100	Introduction to Community Planning (3) (CT)
Geog 160	Urban Geography (3)
Soc 163	Urban Sociology (3) (CT)

An Emerging Third World Region: Subsaharan Africa

Cluster Theme: This cluster is intended to provide an understanding of the peoples of Africa south of the Sahara — their problems and prospects, accomplishments and aspirations, values and perceptions — through a study of their physical environment, their history, and their literature.

Fren 149	Voices of Africa (3) (CT)
Geog 182	Subsaharan Africa (3)
Hist 157	Modern Africa (3)

Environment: Problems and Solutions

Cluster Theme: Our environment, critical to the survival of mankind and all living things, has been threatened by a variety of human-caused problems. These problems, their nature, and potential solutions are treated in-depth by this cluster of courses.

Biol 105	Human Ecology (3)
C R P 135	Environmental Law (3) (CT)
Geog 128	Environmental Pollution (3)

Note: To receive CAPSTONE *credit, a student must complete Biol 105 or Geog 128 before C R P 135 is taken as the required course of this cluster.*

Race and Ethnicity in the United States

Cluster Theme: This cluster focuses on race and ethnicity in the United States and is designed to integrate perspectives and information on race and ethnicity in America from at least two and, ideally, three different programs and disciplines.

Af Am 135	African-American Community (3)
AsAm 110	Asian American Communities (3)
CLS 116	Cultural Change and the Chicano (3)
Hist 186	American Ethnic History (3)
N A S 100	American Indian Religion (3)
Soc 111	Sociology of Minority Relations (3)

Note: To receive CAPSTONE *credit, a student must select one course (3 units) from Hist 186 or Soc 111 and select one to two courses (3–6 units) from Af Am 135, AsAm 110, CLS 116, or N A S 100.*

Acquisition of Knowledge

Cluster Theme: To examine various aspects of the methods and processes by which we acquire information and support our beliefs.

P Sci 106	History of Physical Science (3)
Phil 150	Foundations of Knowledge (3) (CT)
Psych 136	Human Learning and Behavior (3) (CT)

Britain

Cluster Theme: To examine Britain through selected cultural and historical perspectives, including its theatre, literature, and the development of the welfare state.

Drama 188T	British Theatre
Engl 169T	Contemporary British Fiction
Hist 149T	Studies in British History
Mktg 176	International Marketing

Note: Only students participating in the London Semester Program will be eligible for CAPSTONE *credit by enrolling in these classes.*

Asian Cultures and Traditions

Cluster Theme: To provide an understanding of cultural pluralism, awareness of the proportion and significance of other cultures in general, of Asia in particular, and a better understanding of this country's role in different parts of Asia.

Anth 123	Peoples and Cultures of Southeast Asia (3) **or**
Anth 186	Tradition and Change in China and Japan (3) (Same as Hum 140) **and**
Ling 110	Indic Cultures and Traditions (3) (Same as Hum 150)

Pollution, Health and Society

Cluster Theme: To develop knowledge of fundamental engineering and health factors in the environment including governmental regulations, risk analysis, sources of pollution, control technologies, and health effects of more common pollutants.

C E 170	Pollution and Society (3)
H S 170	Health Effects of Indoor Pollution (3) (CT)

Juveniles and Adolescence

Cluster Theme: To study adolescents during intense periods of biological, social and psychological development.

CFS 136	Middle Childhood and Adolescence (3) **or**
Psych 102	Adolescent Psychology (3) **and**
Crim 120	Juvenile Delinquency (3) (CT)

Law, Culture and Society

Cluster Theme: Examines the nature, origins, functions, and limits of law as cultural expressions; focuses on the American legal system and its underlying premises in their American cultural contexts.

Anth 146	Law and Culture (3) (CT)
B A 108	Law and Society (3) (CT)

Our Classical Heritage

Cluster Theme: An analysis of the Greco-Roman legacy via archetypes in religion, drama, sport, and mythology.

Drama 185	History of the Theatre and Drama I (3)
Hist 116	Greek and Roman Religion (3)
Latin 132	Classical Mythology (3) (CT)
P E 111	The Olympic Games (3)

Ancient Peru

Cluster Theme: To acquaint students with the pre-Hispanic peoples and cultures of the Andean area through the study of art, archaeology and geography.

Art H 175	Pre-Columbian Andes (3) (CT)
Geog 172	Ancient Peru (3) (CT)

Transfer Students

Earning an A.A. or A.S. degree does not necessarily mean one has fulfilled CSU admission and/or General Education requirements.

After admission to CSU, Fresno, transfer students with 40 or more units will receive a copy of their advanced standing evaluation indicating how previous college units have been applied toward requirements at CSU, Fresno. Questions about one's evaluation should be directed to the student's adviser or the Evaluations Office. *It is recommended that transfer students bring with them an unofficial copy of all previous college transcripts and their CSU General Education Certification when attending New Student Orientation and Advising Day to ensure accurate advising.*

Transfer admission eligibility is based on *BACCALAUREATE TRANSFERABLE* college units, rather than on all college units. California community college transfers should consult their counselors for information on transferability of courses for admission purposes. Applicants in good standing at the last institution attended may be admitted as *undergraduate transfer* if either of the following requirements are met:

1. Eligible for freshman admission (see *Freshman Requirements*) with a grade point average of *C* (2.0 on a scale where *A* = 4.0) or better in all transferable college units attempted.
2. Completed at least 56 transferable semester (84 transferable quarter) units with a grade point average of *C* (2.0 on a scale where *A* = 4.0) or better if a California resident. *Nonresidents* must have a 2.4 grade point average or better. A maximum of 70 transferable semester (105 quarter) units is allowed from two-year institutions (community/junior colleges).

California State Code of Regulations provides that General Education BREADTH requirements completed at an accredited California public community/junior college and/or a California State University campus by a student transferring to CSU, Fresno shall be accepted (up to 39 units) to the extent stated in the certification from the originating college or university. Each transfer student is required to complete additional units at CSU, Fresno to meet the General Education requirement. Transfer students who change their majors after being admitted to the university are advised that General Education course requirements may also change.

A through *E* Format (Transfer Students)

To aid transfer students in planning their academic programs, the CSU, Fresno General Education Program is presented below in the *A* through *E* format in use at many other California colleges and universities.

Area A — 9 units minimum

Written Communication: Required — English 1

Oral Communication: Select one — Speech 3, 7, or 8

Critical Thinking: Select one — Anthropology 30; Computer Science 1; English 21, 30, 44; Foreign Language 10; Greek 10; Natural Science 4; Philosophy 25, 26, 27, 45; Sociology 3; Speech 5; Surveying Engineering 5

Area B — 12 units minimum

Quantitative Reasoning: Select one —
- Mathematics: Decision Sciences 71; Mathematics 45, 70, 72, 75
- Computer Language: Computer Science 20, 40; Electrical and Computer Engineering 70, 71
- Statistics: Agricultural Economics 71; Health Science 92; Mathematics 11; Plant Science 99; Psychology 42

At least one course is required from each of Divisions 1–3. Courses from Divisions 1 and 2 must have a laboratory component.

Division 1 — Physical Processes

Chemistry 1, 1A, 1B, 3A, 3B
Geology 1, 2, 15 (Man and the Natural Environment only)*
Physical Science 21
Physics 2A, 2B, 5A, 5B, 10

Division 2 — Biological Processes

Biology 10, 15 (Man and the Natural Environment only)*
Botany 1 or 10
Zoology 1 or 10

Division 3 — Behavioral/Environmental Systems

Anthropology 1, 3
Geography 5, 7
Plant Science 105
Psychology 10, 36

Area C — 9 units minimum

At least one course is required from each of Divisions 5–7.

Division 5 — Fine Arts

Art 1
Art History 10, 11
Chicano and Latin American Studies 7, 9
Dance 171
Drama 62, 163
Music 9, 74

Division 6 — Humanities and Literature

Applied Ethics 100
Armenian 148
English 20, 101, 102, 103
French 109, 148
German 148
Greek 148
History 1, 2
Humanities 10, 11, 12
Philosophy 1, 10, 120, 131
Russian 148
Spanish 140, 142, 146

Division 7 — Languages

Armenian 1A, 1B, 2A, 2B
Chinese 1A, 1B, 2A, 2B
French 1A, 1B, 2A, 2B
German 1A, 1B, 2A, 2B
Greek 1A, 1B, 3A, 3B
Hebrew 1A, 1B
Italian 1A, 1B, 2A, 2B
Japanese 1A, 1B, 2A, 2B
Latin 1A, 1B
Linguistics 10
Portuguese 1A, 1B
Russian 1A, 1B, 2A, 2B
Sanskrit 10A, 10B
Spanish 1A, 1B, 2A, 2B, 4A, 4B

In a study of America's best schools, CSU, Fresno was ranked 13th among 112 of the West's regional colleges and universities. The ranking was determined by analyzing data that included a survey of college presidents and deans, academic information from the universities, and statistics from the Department of Education.

"Rating America's Colleges"
U.S. News and World Report

Area D — 12 units minimum

Required: History 11 or 12
Required: Political Science 2 or 101
One course is required from each of Divisions 8 and 9.

Division 8 — Social, Economic and Political Systems

Agricultural Economics 1
Anthropology 2, 15 (Man and the Natural Environment only)*
Economics 25, 40, 50
Geography 2, 3, 4
Political Science 1, 8, 120
Sociology 1, 2

Division 9 — Other Cultures and Women's Studies

African-American Studies 25, 27, 38, 144
Armenian Studies 10
Asian-American Studies 15, 30, 56
Chicano and Latin American Studies 3, 5, 160
Ethnic Studies 1
History 101
Native American Studies 50, 103
Sociology 131
Women's Studies 10, 101, 131, 135

Area E — 3 units minimum

One course is required from Division 4.

Division 4 — Personal Life and Growth

Art 13, 20, 30, 40, 50, 60, 70
Child and Family Studies 38
Dance 116
Drama 22, 34
English 41, 43
Food Science and Nutrition 53
Health Science 90, 124
Industrial Engineering 125
Music 2–102, 3–103, 18–118, 21–121
Physical Education 31
Psychology 61, 132, 171
Recreation 80, 101
Speech 4

CAPSTONE — 6 upper-division units minimum

Note: A minimum total of 9 upper-division units in General Education is required, of which 6 units are CAPSTONE, to be taken after 56 units have been completed.

* Man and the Natural Environment (MNE) is a 17-unit interdisciplinary thematic cluster offered through the School of Natural Sciences. For more information about this program, see *School of Natural Sciences.*



THE UNIVERSITY'S SCHOOLS

School of Agricultural Sciences and Technology

Charles M. Smallwood, *Dean*

Carl L. Pherson, *Associate Dean,* Academic Affairs
Harry P. Karle, *Associate Dean,* Agricultural Operations
To be appointed, *Associate Dean,*
California Agricultural Technology Institute
Dennis L. Nef, *Chair,* Agricultural Economics
Scott A. Williamson, *Acting Chair,*
Animal Sciences and Agricultural Education
N. Joanne Caid, *Chair,*
Enology, Food Science and Nutrition
Nina Dilbeck, *Chair,*
Family Studies and Home Economics
Gary E. Grannis, *Chair,* Industrial Technology
Gary L. Ritenour, *Chair,*
Plant Science and Mechanized Agriculture
Anne V. Rodiek, *Director,* Graduate Programs

The university mission statement emphasizes programs in agriculture and business, reflecting its location in the world's premier agriculture and agribusiness center.

The School of Agricultural Sciences and Technology prepares undergraduate and graduate students for careers in agriculture, industrial technology, industrial arts and home economics. It also fosters applied research and public service programs that contribute to the intellectual, social, cultural and economic vitality of the San Joaquin Valley and California.

Degrees Offered

B.S.: Agricultural Business, Agricultural Education, Agricultural Science (Agricultural Engineering Technology), Animal Sciences, Food and Nutritional Sciences, Industrial Technology (NAIT accredited), Plant Science.

B.A.: Home Economics (AHEA accredited), Industrial Arts, Interior Design (FIDER accredited).

Minors: Agricultural Business, Agriculture, Animal Sciences, Food and Nutritional Sciences, Home Economics, Industrial Arts, Plant Science.

M.S.: Agricultural Business, Agriculture (Agricultural Chemistry, Animal Science), Home Economics, Plant Science.

M.A.: Industrial Arts.

Additional degrees are a B.S. in Child Development (see Family Studies and Home Economics) and a Bachelor of Vocational Education (see Industrial Technology). Teaching credential programs offer a secondary single subject credential in agriculture, home economics or industrial arts, plus a specialist teaching credential in agriculture.

Professional Preparation

Student Activities. More than 30 professional associations, honor societies, judging teams, show teams, clubs and social fraternities associated with the school provide excellent opportunities for leadership development and industry contact. Numerous teams participate in regional and national intercollegiate competitions. The Student Executive Council, comprised of representatives from these student organizations, coordinates school-wide functions and works with the Associated Student Senate to obtain activity funding.

Production Projects. Supervised student project programs in animal and crop production utilize a hands-on approach for practical application of theory learned in the classroom. To qualify, a student must have coursework in the corresponding major and be enrolled in an Enterprise Management course as well as demonstrate proficiency in equipment operation. Financial support for student enterprise projects is provided by CSU, Fresno's Agricultural Foundation.

Industry Internships and Cooperative Education. Non-paid and paid work opportunities abound for qualified students to serve in an industry setting appropriate to their degree and programs of study. Integration of academic credit and work experience is attained by participating in these programs, while professional employment prospects after graduation are greatly enhanced.

Continuing Education. Seminars, workshops and field day demonstrations are offered to meet the in-service education needs of the agricultural community. Similar programs provide home economists and industrial technologists opportunities for professional development.

Instructional Facilities

A 1,083-acre **University Farm Laboratory** adjacent to the campus provides a unique opportunity for students to directly apply the knowledge and skills acquired in the classroom. Vineyard, orchard, vegetable, cotton and field crop enterprise projects, supervised by plant science and mechanized agriculture faculty, develop production and management skills. Similar enterprise projects at the beef, sheep and swine units are supervised by the animal sciences faculty. The modern on-campus dairy, veterinary hospital, quarter horse, and feed mill units plus more than 5,000 acres of Sierra foothill rangeland also support the instructional programs in animal sciences.

Specialized laboratories and facilities for the **Agricultural Science** programs include: agricultural computing, enology, raisin processing, dairy processing, meats, food preparation and product development, seed technology, soil science, ornamental horticulture, and mechanized agriculture.

Family Studies and Home Economics students utilize the following laboratories: textiles, fashion/clothing, infant/toddler, and child development.

Industrial Technology facilities include: construction, industrial design, fluid power, energy and process control, machine tools, electrical, industrial and general electronics, materials science, transportation, drafting, graphic communications, and Computer Integrated Manufacturing labs.

Research and Technology Transfer

The agricultural technology development, training and demonstration activities of the **California Agricultural Technology Institute (CATI)** offer students opportunities to interact with faculty and industry experts on state-of-the-art energy, water, production, management and computer applications projects. CATI provides funding for faculty research, industry conferences and special projects conducted through the following entities: Center for Agricultural Business, Center for Irrigation Technology, Viticulture and Enology Research Center, and the San Joaquin Experimental Range.

School of Arts and Humanities

Phyllis Irwin, *Acting Dean*

Robert G. Ware, *Associate Dean*
Frank Laury, *Chair,* Art
F. Andrew Hart, *Chair,* English
Maurice Gendron, *Chair,* Foreign Languages
James B. Tucker, *Chair,* Journalism
Jack B. Zeldis, *Chair,* Linguistics
Jack Fortner, *Acting Chair,* Music
Jack A. Pitt, *Chair,* Philosophy
John C. Cagle, *Chair,* Speech Communication
R. C. Adams, *Chair,* Telecommunications
Ronald D. Johnson, *Chair,* Theatre Arts

The arts and humanities are the eye of the pyramid, providing vision, depth and discernment for all areas of knowledge. From the "Know thyself" of philosophy to the "Get it right" of journalism, the arts and humanities illuminate everything from self to society.

Art, music, telecommunications and theatre offer opportunities to participate in and absorb the full range of creative and interpretive experience. English and speech communication, letters and language, sum up the best that has been thought and said. Foreign languages and linguistics do all of that and more. Besides providing culture, in the Germanic sense of the term, knowledge of foreign languages offers insights into whole new worlds of people. Linguistics offers the same opportunity through the English language, but from the opposite end of the telescope.

Journalism is best equipped to report on, comment on, and analyze the wisdom and folly of today. Philosophy deals with the wisdom of the ages — a heavy phrase for a discipline that teaches us how remarkable and timelessly "modern" the human mind has always been, from apple to Apple.

Given the broad spectrum of human concerns in the arts and humanities, it should come as no surprise that the classical studies and the humanities interdisciplinary minors are also housed in the school.

The School of Arts and Humanities offers majors in the following areas:

Art
English
French
German
Journalism with sequences in:
- advertising
- news-editorial
- photocommunication
- public relations
- radio-television news communication

Linguistics with options in:
- English as a second language
- Spanish-English bilingualism

Music
- Option I — performance, composition, music history
- Option II — teaching

Philosophy with options in:
- prelaw
- religious studies

Russian
Spanish
Speech Communication
Telecommunications with options in:
- creative
- management
- news/public affairs
- production

Theatre Arts
Theatre Arts — Dance Option

The school offers minors in the following areas:

Armenian Studies
Art
Classical Studies
English
French
German
Humanities — Interdisciplinary
Journalism with sequences in:
- advertising
- news-editorial
- photocommunication
- public relations
- radio-television news communication

Latin
Linguistics
Music
Philosophy
Russian
Spanish
Speech Communication
Telecommunications
Theatre Arts

The school also offers graduate programs leading to the M.A. degree in:

Art
English with options in:
- literature
- creative writing
- composition

Linguistics with option in:
- English as a second language

Mass Communication
Music
Spanish
Speech

For specific information concerning courses that meet requirements for General Education, teaching credentials and degree programs, consult the department chair of the area of interest.

London Semester

California State University, Fresno's London Semester enables students to live and study in London each spring semester. Students earn full residence credit for all coursework taken in the program. The courses are regularly scheduled catalog courses taught by CSU, Fresno faculty.

All students currently enrolled at, or transferring into CSU, Fresno, are eligible to participate in the London Semester program. Participants are selected on the basis of their overall academic qualifications, including grade point average, units completed and personal interview. Priority is given to students who have completed a minimum of 40 semester units and who have a cumulative grade point average of 2.75 or higher.

Students are selected for London Semester during the early part of the fall semester. Students participating in the program pay the normal university fees for full-time status. All other personal expenses are the responsibility of the student, including round trip airfare, textbooks, room charges for program-arranged housing, meals, and incidentals.

Program information and application forms are available from the London Semester Program Office, San Ramon 4, Room 250.

School of Business and Administrative Sciences

Joseph J. Penbera, *Dean*

Luis Ma. R. Calingo, *Associate Dean*
Lee Lockhart, *Director,* Valley Business Center
Manuchehr Shahrokhi, *Director,* Graduate Program
Dennis M. Baker, *Chair,* Accountancy
Paul M. Lange, *Chair,* Finance and Business Law
Harry G. Costis, *Chair,*
Information Systems and Decision Sciences
Gerald L. Jones, *Chair,* Management
Richard D. Nordstrom, *Chair,* Marketing and Logistics
Lt. Col. Robert J. Seigel, *Chair,* Aerospace Studies
Lt. Col. William F. Hausman, *Chair,* Military Science

The mission of the School of Business and Administrative Sciences at California State University, Fresno is to provide responsible academic and business leadership and service to diverse populations and to industry and government in Central California, the state, the nation and other countries.

This leadership and service is based on providing AACSB-accredited undergraduate and graduate degree programs, emphasizing high quality in applied research, professional and continuing education, consulting, contracting and other activities.

Degrees Offered

B.S., M.S., M.B.A., M.S.A.

Major Requirements

Units

I. Core requirements (Required of all business administration majors) 40–43

II. Option requirements 18–35

Business students all have one common major — business administration. Within the major, there are 15 option areas from which students can choose; each student is required to complete an option. Students have their choice of the following options, which are arranged below according to the department in which they are offered:

Accountancy Department
(See option requirements)
Accountancy 34–35
Finance and Business Law Department
(See option requirements)
Agribusiness 18
Finance 25–26
Financial Services 30–32
International Business 30
Legal Environment of Business 21
Real Estate and Urban Land Economics 21–22
Risk Management and Insurance 18
Information Systems and Decision Sciences Department (See option requirements)
Computer Applications and Systems 24
Decision Systems 20
Information Management 24
Management Department
(See option requirements)
Human Resource Management 24
Logistics/Operations Management 25–28
Management 26–30
Marketing and Logistics Department
(See option requirements)
Marketing 24

III. General Education requirements 54

Choose from General Education requirements. Choices must include Econ 40 (or Ag Ec 1) and Econ 50 in BREADTH, Division 8.

Business students must complete DS 71 or one semester of approved college mathematics beyond intermediate algebra.

IV. Electives and remaining major/degree requirements 0–12

Business students must complete a minimum of 51 units outside of the School of Business and Administrative Sciences (courses selected for General Education may be included in these units) and a minimum of 40 upper-division business units.

Successful completion (grade of *C* or better) of Engl 1 or its equivalent is a prerequisite to enrollment in upper-division business courses. Every upper-division business course has writing requirements in the course, and the quality of the writing is used in determining grades in the course. Completion of the upper-division writing skills requirement (successful completion of IS 105W, another authorized *W* course or passing the Upper-Division Writing Examination) is a prerequisite to enrollment in Mgt 187.

V. Total Requirements for Business Administration Degree 124–132

General Business Minor

	Units
Acct 4A	3
Elect from: B A 18, Fin 120, Mgt 104, 106, 110, Mktg 100, DS 73	8
Elect from not more than two fields (8 upper division): Acct, B A, Fin, LOG, HRM, Mgt, Mktg, POM, IS, DS	11
	22

Business Teaching Credential Requirements

The School of Business and Administrative Sciences offers students a single subject business credential to teach in grades K–12. All students seeking a teaching credential in business must complete the requirements for a Bachelor of Science degree in Business Administration.

Business teacher education students should consult the appropriate advisers in the schools of Business and Administrative Sciences and Education and Human Development as early in their programs as possible.

School of Education and Human Development

Barbara G. Burch, *Dean*

Robert H. Monke, *Associate Dean*
H. Dan Smith, *Chair,* Advanced Studies
Bernice Bass de Martinez, *Chair,* Teacher Education
Ric Brown, (Interim) Administration and Supervision
Robert Segura, Bilingual/Cross-Cultural Education
Louis F. Markert, Counselor Education
Atilano Valencia, Curriculum and Instruction
Doris O. Smith, Early Childhood Education
Robert H. Monke, Graduate Program
Robert Pritchard, Language Development Specialist
Jacques Benninga, Liberal Studies
Joan Henderson, (Interim) Multiple Subject Field Experience
Judith Neal, (Interim) Multiple Subject
Bonnie Dutton, Reading
Susan Tracz, Research and Service
Jolyne S. Daughtry, Single Subject
Janice Chavez, Special Education
Shareen Abramson, Victim Services Certificate of Special Studies

The School of Education and Human Development (SOEHD) has established as its primary mission the maintenance of quality educational programs designed to prepare teachers and other educational leaders for service in public and private schools and other educational institutions.

Emphasis is directed toward preparing highly competent educators and human development specialists, providing professional support and leadership to the area community, promoting applied research, and providing experiences and opportunities that will enable employed professionals to remain current in their fields.

The SOEHD directs its full attention to the enhancement of human potential so that those who work in the field of education and human development function more effectively and productively in an ever-changing and increasingly diverse society.

Accreditation and Program Approval

The School of Education and Human Development credential and master's degree programs are currently accredited by the National Council for Accreditation of Teacher Education (NCATE) and the Western Association of Schools and Colleges (WASC). All credential programs are approved by the California Commission on Teacher Credentialing (CTC).

Credential Programs

Basic credential programs are established on the assumption that an effective educator needs a liberal education, should be well versed in subject matter, should acquire knowledge of the psychological and cultural factors that influence learning and achievement, and should be highly trained in the principles and practices of teaching.

The school provides basic teaching credential programs in elementary (multiple subject) and secondary (single subject) teaching. Specialist teaching credential programs are offered in agriculture, early childhood, reading and special education. Advanced services credential programs are offered in administration and supervision, clinical rehabilitation, health and pupil personnel (counseling). The professional preparation programs of the school are offered with the cooperation and support of central valley public school districts and other agencies. Further information is available in the Teacher Education and Advanced Studies departmental offices and in the SOEHD Admissions Office (EdP 120).

Basic Teaching Programs

- Multiple Subject.
- Multiple Subject, emphasis in Early Childhood Education.
- Multiple Subject, emphasis in Bilingual/Cross-Cultural Education.
- Single Subject.

Specialist Teaching Programs

- Agriculture.
- Early Childhood.
- Language Development Specialist Certificate.
- Reading.
- Special Education.

Services Credential Programs

- Clinical-Rehabilitative.
- Health (School Nurse).
- Preliminary Administrative.
- Professional Administrative.
- Pupil Personnel.
- School Psychology.

Certificate Program

- Victim Services.

Master's Degree Programs

The School of Education and Human Development offers both the Master of Arts and the Master of Science degrees.

M.A. in Education

- Administration and Supervision.
- Curriculum and Instruction.
- Early Childhood Education.
- Reading.
- School Counseling.

M.A. in Special Education

M.S. in Counseling

- Career Development Counseling.
- Marriage, Family and Child Counseling.

School of Engineering

Elden K. Shaw, *Dean*

Karen L. Frair, *Associate Dean*
Karl E. Longley, *Chair,* Civil and Surveying Engineering
Joseph C. Plunkett, *Acting Chair,* Electrical and Computer Engineering
Delbert E. Robison, *Chair,* Mechanical and Industrial Engineering

The School of Engineering provides quality engineering education to its students. Its program places emphasis on mathematics, physics, chemistry, engineering science, and the humanities and social sciences. Computer-aided engineering has been incorporated into all of its curricula.

Three departments in the school offer six undergraduate degree programs: Civil, Computer, Electrical, Industrial, Mechanical and Surveying Engineering. A graduate degree program in Civil and graduate degree options in Electrical and Mechanical Engineering (off-site) are also available.

Department of Civil and Surveying Engineering. Civil engineers plan, design and supervise construction of highways, railways, water supply systems, sewage systems, subdivisions, buildings, aircraft and sea vessel ports, pipelines, dams, bridges and tunnels. They also supervise the operation of public works such as water treatment plants and transportation systems.

Surveying engineering involves measuring pieces of property using optical instruments, mechanical devices, radar, lasers or heat radiating equipment. Surveyors use overlapping photographs to make accurate maps of the earth, i.e., photogrammetry. Surveyors also lay out highways, buildings and shopping centers, and prepare maps and descriptions of property.

Department of Electrical and Computer Engineering. Electrical engineering is one of the broadest and largest fields of engineering. Electrical engineers work in electronics, terrestrial and space communication, computer systems, power generation, distribution and control systems. CSU, Fresno has one of the few electric power programs available in the state.

Computer engineering is a new and rapidly growing field that encompasses the design of computers and computer systems, digital interface design, and microprocessor design and applications. Graduates of this program can expect to join computer firms, business organizations, defense industries, educational institutions or government agencies.

Department of Mechanical and Industrial Engineering. Mechanical engineers create mechanisms, machines and processes associated with nearly all industries. This includes the manufacture of goods and the development of space and transportation systems. They also create devices for generation of power from energy sources such as geothermal, solar and nuclear.

Industrial engineering arose when specialists were needed to derive more effective production processes, quality control, human-machine interfaces and material flow systems. This includes engineering analyses for the design of man-machine systems, optimization of industrial systems and the scientific management of engineering activities.

Majors and Minors. Students must declare an engineering major in order to take upper-division engineering courses. The School of Engineering does not offer any minors.

Accreditation. The Civil, Electrical, Industrial, Mechanical and Surveying Engineering programs are accredited by the Accreditation Board for Engineering and Technology (ABET), the accrediting agency of the engineering profession.

High School Preparation. The recommended preparation for engineering consists of: English (4 years), algebra (2 years), geometry (1 year), trigonometry (½ year), physics or chemistry (1 year). Additional recommended courses are: advanced mathematics (½ year), chemistry or physics (1 year) and mechanical drawing (½ year). Since all engineering curricula are computer intensive, exposure to computer programming is recommended.

Bachelor of Science Degree Requirements. The Bachelor of Science degree is granted upon completion of any of the school's six programs. Students are required to complete up to 138 units including a minimum of 48 units of General Education courses. Mathematics, physical science or engineering courses taken *CR/NC* are not counted toward fulfillment of degree requirements in the School of Engineering.

Scholarship Requirements. A minimum grade point average (GPA) of 2.0 must be maintained in all courses taken in the School of Engineering. Students who drop below a 2.0 GPA in engineering courses are placed on probation. Failure to eliminate the grade point deficiency results in disqualification from the School of Engineering. Disqualified students may not enroll in engineering courses either during the regular academic year, summer sessions or through the Division of Extended Education. Students in engineering who wish to drop any engineering course after the fourth week deadline may do so only for very serious reasons which normally would require withdrawal from all courses for the remainder of the semester.

Graduate Program. The School of Engineering offers the Master of Science in Civil Engineering on campus and options in Electrical Engineering and Mechanical Engineering at the Edwards Air Force Base.

The M.S. degree program is designed to provide additional benefits of salary and career opportunities to graduates of a baccalaureate degree program in engineering. It provides continuing development for practicing engineers, additional career entry preparation for continuing students, and excellent preparation for persons planning to teach in pre-engineering or engineering technology programs.

School of Health and Social Work

Richard D. Ford, *Dean*

Sanford M. Brown, *Associate Dean*
Gary A. Cunningham, *Chair,* Athletics
Kenneth G. Shipley, *Chair,* Communicative Disorders
Ronald C. Schultz, *Chair,* Health Science
Pauline Kliewer, *Chair,* Nursing
Joanne W. Schroll, *Chair,* Physical Education and Human Performance
Michael B. Hoffman, *Coordinator,* Recreation Administration Program
Darlene L. Stewart, *Coordinator,* Physical Therapy Program
E. W. (Bud) Stude, *Coordinator,* Rehabilitation Counseling Program
Benjamin Cuellar, *Chair,* Social Work Education

The mission of the School of Health and Social Work is to provide career-oriented education in a liberal arts context at the baccalaureate level and graduate degree programs in specialized disciplines at the master's level. The school emphasizes the significance of health promotion and wellness in a society with increasing awareness of the importance of lifestyle in determining the quality of physical, mental, environmental, intellectual and spiritual health.

The school was formed in 1981 when the university was reorganized. It is comprised of the School of Social Work, the former Division of Health Professions and the departments of Athletics, Physical Education and Human Performance, and the Recreation Administration Program from the former School of Professional Studies. The new school was established to bring programs that affect the health and social welfare of the Valley residents into one organized unit.

The school's departments provide programs leading to the Bachelor of Arts, the Bachelor of Science, the Master of Arts, the Master of Social Work and the Master of Science degrees. Preparation is offered for professional careers in the specialized areas of communicative disorders with options in audiology, speech and language pathology, and education of the deaf; health science with undergraduate options in community health, environmental health science, health services, and occupational safety and health, and graduate program options in environmental health, health services administration and health education-teaching; nursing with options in nursing administration, nursing education, clinical nurse specialist and nurse practitioner; physical education with options in adaptive physical education, alternate careers, athletic training and teaching; physical therapy; recreation administration with programs in public and private recreation, therapeutic recreation, commercial recreation and recreation administration; rehabilitation counseling; social work education; and the general areas of teaching, business, public or government service.

The school also administers the following programs:

The Center for Continuing Education in the Health Professions serves trained health service professionals by supplementing professional education and inservice training to improve the level of effectiveness in practice and to provide current information and learning opportunities for those persons desirous of career programs. The center was initially developed to provide allied health and nursing continuing education in the rural areas.

The Human Performance Laboratory and the commitment of the school to fitness, exercise physiology and wellness is a facility where students can obtain a hands-on experience and practical application of human performance research. The objectives of this laboratory benefit many related academic programs: enhancing the sports medicine facilities, providing an opportunity for faculty and student research in the sports sciences and sports medicine and providing a central focus for community service in the area of adult fitness, youth sports, and athletics and encouraging interdepartmental cooperation and further sharing of resources and ideas.

The GAIN (Greater Avenues for Independence) Program provides employment to able-bodied public assistance recipients through a structural sequence of employment-related activities and supportive services that are designed to maximize their opportunities for employment. The CSU, Fresno Rehabilitation Counseling Program, in contract with the Fresno County Department of Social Services, is providing assessment services to GAIN participants. Assessments include diagnostic testing, work sample testing, an in-depth interview, motivational assessment and a written report for each participant with an interpretation of diagnostic testing results, evaluation of the interview, a suggested vocational objective and an assessment of the need for employment training.

The Fresno Community Hospital-CSU, Fresno Job Station Evaluation Program, administered by the Rehabilitation Counseling Program, offers work evaluation assessments using job stations housed at Fresno Community Hospital. Graduate students in Rehabilitation Counseling learn practical assessment skills working with the program administrator and hospital personnel. Disabled clients are observed daily. The work areas, or job stations, normally available for use offer a wide variety of settings, including maintenance, mechanical, clerical, cashier, food service, housekeeping or paramedical fields. Further, work adjustment and work experience are also available should the counselors request these services.

The Interdisciplinary Minor in Gerontology is a program especially designed to serve undergraduate majors in communicative disorders, home economics, health sciences, nursing, physical therapy, psychology, recreation, social welfare and sociology. It also provides training for those professionals currently working for service agencies for the aging and aging individuals who are interested in gaining greater insight into this period of their lives.

The Certificate in Gerontology is an interdisciplinary program of study awarded to students who complete 12 units of carefully selected courses in the field of gerontology. Normally the students admitted to the program will have had some college preparation (e.g., an A.A. or A.S. degree, two years of college) or two years of experience related to the field of aging.

For a listing of interdisciplinary courses, see *Health and Social Work — Interdisciplinary Courses.*

School of Natural Sciences

Kin-Ping Wong, *Dean*

Stanley M. Ziegler, *Associate Dean*
Ronald L. Evans, *Chair,* Biology
David L. Zellmer, *Chair,* Chemistry
Henderson Yeung, *Chair,* Computer Science
Jon C. Avent, *Chair,* Geology
Robert F. Arnold, *Chair,* Mathematics
John R. Donaldson, *Chair,* Physics
Terry G. Newell, *Chair,* Psychology

The School of Natural Sciences provides for study in the disciplines of biology, chemistry, computer science, geology, mathematics, physics and psychology. Instruction in these disciplines is designed to accomplish either of two objectives.

The first is to provide enough professional training, at either the undergraduate or graduate level, to serve as a foundation for a career in the discipline or for continued study at the graduate level in pursuit of advanced degrees. The second is to provide a means for all university students to gain an understanding of the world of science and to give students specific skills for use in related disciplines.

Majors and Credentials

The School of Natural Sciences offers the following majors and credentials.

Biology: B.A. in Biology. Options in: biological science, botany, environmental biology, functional biology, microbiology and zoology. B.S. in Microbiology. Minor in Biology. M.A. in Biology. M.S. in Marine Sciences. Single Subject Teaching Credential in Life Science.

Chemistry: B.A. and B.S. in Chemistry. Minor in Chemistry. M.S. in Chemistry. Single Subject Teaching Credential in Physical Science.

Computer Science: B.S. in Computer Science. Minor in Computer Science.

Geology: B.S. in Geology. Minor in Geology. M.S. in Geology.

Mathematics: B.A. in Mathematics. Concentrations in: applied mathematics, precollege teaching, pure mathematics, and statistics and probability. Minor in Mathematics. M.A. and M.S. in Mathematics. Credential Program Single Subject Waiver.

Physics and Physical Science: B.A. and B.S. in Physics. Minor in Physics. Minor in Physical Science. M.A. and M.S. in Physics. Single Subject Teaching Credential in Physical Science (Physics Option).

Psychology: B.A. in Psychology. Minor in Psychology. M.A. and M.S. in Psychology. Service credentials in: pupil personnel and school psychologist. Education requirements for: marriage, family and child counselors.

School Programs: Man and the Natural Environment, South Pacific Semester and Certificate in Biotechnology.

High School Preparation

Recommended preparation for study in the natural sciences includes English (4 years), algebra (2 years), geometry, trigonometry and biology. For study in the physical sciences (chemistry, geology and physics) or mathematics, additional science and mathematics courses are recommended.

Interdisciplinary Study

The school also offers the opportunity for interdisciplinary science study in courses designed to meet student interest in such areas as biotechnology, environmental studies and ecology, science for public school teachers and science for health professions. Students interested in developing an interdisciplinary degree program through the special major should contact the dean.

The school is a cosponsor, with the School of Agricultural Sciences and Technology, of a postbaccalaureate biotechnology certificate program. This 19-unit program can be completed in one year if entering students have the appropriate prerequisites. Complete information and application materials may be secured from the dean's office.

Man and the Natural Environment

(17 unit thematic cluster)
This cluster of intensive field courses is presented at the introductory level. Concurrent registration in the four courses listed below is required. Fifteen of the 17 units of credit are applied to G.E. university requirements. Involves approximately one month in the field. A special fee for transportation and food on field trips is required. For further information, contact the Dean, School of Natural Sciences, ext. 3936.

N Sci 15	Environmental Science (2)
Anth 15	Man's Place in the Natural Environment (5)
Biol 15	An Ecological Approach to Life Science (5)
Geol 15	The Earth and its History (5)

Preprofessional Preparation. Preprofessional advising is available for students preparing for careers in medicine, dentistry, veterinary medicine, and other professions. Students should contact their respective major and preprofessional advisers before enrolling in classes each semester to stay abreast of current developments. A current list of CSU, Fresno preprofessional advisers is available in the Office of Advising and Orientation or in the dean's office.

Cooperative Education. This program provides the opportunity to combine closely-related work experience with a student's classroom and laboratory studies.

Clubs and Organizations. The school has a variety of active clubs, organizations and other programs including Black Students in Science, Caduceus (premedical), Chicano Health Organization, Predental Club, Tri Beta biological honor society, Chemistry Club, Association for Computing Machinery, Geology Club, Society of Physics Students, Psi Chi honor society, Psychology Student Union, and the *Journal of the School of Natural Sciences.*

Research. The school actively fosters individual as well as joint research among campus scientists and with investigators at other regional research centers. Both basic and applied research activities are encouraged and recognized.

School of Social Sciences

Peter J. Klassen, *Dean*

Shien-min Jen, *Chair,* Anthropology
Bill Flores, *Coordinator,* Chicano and Latin American Studies Program
Max Futrell, *Chair,* Criminology
Linda Shaffer, *Chair,* Economics
Robert Mikell, *Coordinator,* Ethnic Studies Program
James Kus, *Chair,* Geography
John C. Kendall, *Chair,* History
Philip F. Beach, *Chair,* Political Science
Elizabeth N. Nelson, *Chair,* Sociology
Susan S. Arpad, *Coordinator,* Women's Studies Program

The School of Social Sciences offers a variety of degree, credential and certificate programs at both the undergraduate and graduate levels. The curriculum is planned to guarantee breadth of academic experience and to preserve a reasonable depth and rigor in a single academic discipline or study area.

The school participates in many interdisciplinary programs (see *Special Programs*) both in and beyond the social sciences. Attention is also invited to the *Social Science Major* for obtaining elementary and secondary teaching credentials and for acquiring a good background for a professional career in law, public service and other areas.

Strongly committed to a traditional liberal arts education, yet maintaining a varied and strong participation in the university General Education Program, the School of Social Sciences offers a broad range of majors that prepare students for various professions or further study. The school is sensitive to the widely held view that studies in the liberal arts provide the best preparation for careers of leadership in business, public service and other areas. The school stresses the broad character of its curriculum, assuring today's graduate a place in a society where the narrow specialist is often soon obsolete, but where the adaptable generalist is highly welcome.

The bachelor's degree in the various disciplines of the social sciences is designed to develop the essential skills of educated people to adapt to a rapidly changing world, and to provide leadership as new needs arise. The various disciplines help students to acquire and use knowledge, to articulate positions effectively and to solve problems. In addition, the development of a significant degree of mastery in one of the social sciences is in itself a rewarding and enriching experience. Degrees in social sciences indicate that students, as they have acquired a greater body of knowledge, have also attained a sense of perspective, more effective communication skills, a heightened respect for quality and excellence, more appreciation of creativity and a greater understanding in dealing with people from different backgrounds.

The School of Social Sciences is thus committed to providing its majors with a concern for human values and with the ability to think clearly, critically and analytically. These graduates, while understanding the value of practical and professional skills, realize that no career can be successfully pursued without the benefit of humanistic values and insights. The social sciences help students become full, rich human beings who are able to reach out beyond their professional careers.

The School of Social Sciences also offers interdisciplinary topic courses and an internship course.

Social Science (S Sci)

150T. Topics in the Social Sciences (1–3). Discussion and analysis of current topics in the social sciences. Topics selected for discussion will be taught with an interdisciplinary focus and structure. Topics will be rotated.

185. Internship (1–6, max total 6). Prerequisite: upper-division or graduate standing; permission of instructor. Supervised work experience in the applied aspects of the social science disciplines. Hours to be arranged. *CR/NC* grading only.

Departments, Programs and Majors

The School of Social Sciences offers instruction in the following departments and/or programs: anthropology, Chicano and Latin American studies, criminology, economics, ethnic studies, geography, history, political science, city and regional planning, sociology and women's studies.

Majors: anthropology, criminology, economics, geography, history, political science, public administration, social science and sociology.

Minors: anthropology, Asian-American studies, Chicano/Latino studies, criminology, ethnic studies, African-American studies, geography, history, Latin American studies, political science, public administration, sociology, urban studies and women's studies.

Master's degrees: criminology, geography, history, political science, (international relations), public administration, and city and regional planning.

China Semester

CSU, Fresno, in cooperation with Hangzhou University, situated in Hangzhou, offers a semester of study in the People's Republic of China. Students can earn credit for 12–18 semester units as the equivalent of one semester of academic work at CSUF. Upon successful completion of the program, Hangzhou University issues a certificate of participation. Courses, credits and grades appear on CSUF transcripts.

This program combines academic immersion in Chinese culture and language with travel to more than 15 areas of cultural and historic interest throughout China. Two weeks of travel are scheduled to follow the Hangzhou program. Program information and application forms are available from the **Office of the Dean, Social Science Building, Room 108.**

Centers in the School

Several departments have established ancillary units designed to facilitate research, community projects and other activities intended to enhance the university's service to a broad constituency. Special emphasis is placed on student, faculty and community interaction. The following centers are engaged in a variety of projects: Chicano Research Center, Justice Center and Social Research Laboratory.



COURSES AND PROGRAMS

Course Prefixes, Symbols and Terms

The following chart is a guide to the appropriate prefixes used in this catalog for the university's departments and programs of study.

A Eth	Applied Ethics
A S	Advanced Studies
A Sci	Animal Science
A Sp	Aerospace Studies
Acct	Accountancy
AET	Agricultural Engineering Technology
Af Am	African-American
Ag Bs	Agricultural Business; Graduate
Ag Ec	Agricultural Economics
Ag Ed	Agricultural Education
Agri	Agriculture; Graduate
Anth	Anthropology
Arm	Armenian
Arm S	Armenian Studies
Art	Art
Art H	Art History
AsAm	Asian-American Studies
ATHL	Athletics
B A	Business Administration
B W E	Basic Written English
Biol	Biology
Bot	Botany
Bus	Business and Administrative Sciences; Graduate
C D	Communicative Disorders
C E	Civil Engineering
C R P	City and Regional Planning
C Sci	Computer Science
CFS	Child and Family Studies
Chem	Chemistry
Chin	Chinese
CLS	Chicano and Latin American Studies
Const	Construction Management
Cr Sc	Crop Science
Crim	Criminology
CSH	Consumer Science and Housing
D Ind	Dairy Industry
Dance	Theatre Arts
Drama	Theatre Arts
DS	Decision Sciences
ECE	Electrical and Computer Engineering
E E	Electrical Engineering
E F L	English as a Foreign Language
Econ	Economics
EHD	Education and Human Development
Engl	English
Engr	Engineering
Enol	Enology
Ent	Entomology
Eth S	Ethnic Studies
F L	Foreign Language
F M	Fashion Merchandising
Fin	Finance
Fren	French
FScN	Food Science and Nutrition
G S	Graduate Studies
Geog	Geography
Geol	Geology
Germ	German
Geron	Gerontology
GID	Graphic and Interior Design
GPA	Graduate Public Administration
Grk	Greek
H Ec	Home Economics Education; Graduate
H S	Health Science
Hebr	Hebrew
Hist	History
HRM	Human Resources Management
HSW	Health and Social Work
Hum	Humanities
I E	Industrial Engineering
I S A	International Studies — Abroad
I S C	International Studies Course
I T	Industrial Technology
IntD	Capstone Interdisciplinary (GE)
IntD ___Nex	Capstone Nexus (GE)
IS	Information Systems
Ital	Italian
Japn	Japanese
Jour	Journalism
Latin	Latin
Ling	Linguistics
LOG	Logistics
M Com	Mass Communication
M E	Mechanical Engineering
M S	Military Science
M Sci	Moss Landing Marine Laboratories
Math	Mathematics
Mgt	Management
Micro	Microbiology
Mktg	Marketing
Music	Music
N A S	Native American Studies
N Sci	Natural Science
Nurs	Nursing
OH	Ornamental Horticulture
P E, PE AC	Physical Education
P Sci	Physical Science
Ph Th	Physical Therapy
Phil	Philosophy
Phy	Physiology
Phys	Physics
Pl Pr	Plant Protection
Pl Si	Political Science
Plant	Plant Science
POM	Production/Operations Management
Port	Portuguese
Psych	Psychology
R C	Rehabilitation Counseling
Rec	Recreation
Russ	Russian
S E	Surveying Engineering
S Sci	Social Sciences
S Wrk	Social Work Education
SI	Soils/Irrigation
Skt	Sanskrit
Soc	Sociology
Span	Spanish
Spch	Speech Communication
T Ed	Teacher Education
TCOM	Telecommunications
Univ	University
VTF	Viticulture/Tree Fruit
W S	Women's Studies
Zool	Zoology

Course Numbering System

1–99 *Lower-division* courses designed for first- and second-year students.

100–199 *Upper-division* courses designed for third-, fourth- and fifth-year students; counted as graduate work for students with graduate status; permitted for use on a master's degree program only with departmental approval.

190 *Independent study, undergraduate.*

100G–199G *For graduate* students only; designed for use in the first year of two-year master's degree programs; intensive combination of material normally offered at the undergraduate level.

200–297 *Graduate courses* open to holders of baccalaureate degrees and, with prior approval of the Graduate Division, to last-semester seniors with superior preparation and ability; designed for use on master's degree programs; when taught by Extension, count as upper division in master's degree programs. Graduate-level courses may not be applied toward either a second undergraduate major or second baccalaureate degree.

290 *Independent study, graduate.*

298 *Master's Degree Project.* Open to graduate students having achieved advancement to candidacy.

299 *Master's Degree Thesis.* Open to graduate students having achieved advancement to candidacy.

300–399 *Designed to meet professional needs* that cannot be served by regular established course offerings. *These courses are offered only through Extension and summer sessions.* They assume completion of the bachelor's degree and/or appropriate professional service and are focused upon the problems that enrolled students encounter in their professional service. Although these courses are designed primarily for purposes other than the partial fulfillment of degree and credential requirements, they may, with approval by the department, be applied toward the major. They may be used as part of the 40-unit, upper-division requirement for the B.A. degree and as electives in the fulfillment of the total requirements for a baccalaureate degree and/or credential. They may not be used to meet the requirements of a master's degree.

Symbols

A–B Two-semester course normally taken in sequence.

A, B Listed as separate courses, may be taken independently.

F Field course.

L Laboratory associated with another course.

R Remedial course.

T Topics course, varied area subject matter, repeatable for credit.

W Writing skills course, meets upper-division requirement for graduation.

Course Descriptions. Courses are listed by number, title, units and maximum total credit. Each unit generally represents one hour per week in class and two hours of preparation; courses involving laboratory, activity or other application normally require additional hours of class attendance. Lecture-laboratory hours indicate deviation from the usual one class hour per week for one unit of credit. Prerequisites are listed at the beginning of the course description. Course offerings are listed each semester in the *Schedule of Courses.*

Prerequisites. Course prerequisites are designed to protect students by ensuring that they have the necessary background and preparation for success in the course. Transfer courses with equivalent content are accepted in lieu of stated prerequisites. Students should check the prerequisites carefully before registering in a course to be sure that they have been met. The instructor can deny admission to a course if a student has not met the prerequisites.

Permission of the Instructor. The instructor has the authority to waive the stated prerequisites for a course if it is in the interest of the student to do so and if in the instructor's judgment, the student has a background sufficiently adequate to permit satisfactory performance in the course.

Students will not receive credit for courses in foreign language or mathematics if credit has been awarded previously for a higher numbered course for which the lower numbered course is a prerequisite.

CAN. The California Articulation Number identifies some of the transferable, lower-division, introductory (preparatory) courses commonly taught on California college campuses. The CAN (ex. CAN ECON 2) is listed parenthetically at the end of the course description.

Aerospace Studies

School of Business and Administrative Sciences
Department of Aerospace Studies
Lt. Colonel Robert J. Seigel, Chair
North Gym, Room 158
(209) 278-2593, (209) 291-9947

Air Force Reserve Officer Training Corps (AFROTC)
Minor in Aerospace Studies



Oh, I have slipped the surly bonds of earth,
And danced the skies on laughter-silvered wings;
Sunward I've climbed, and joined the tumbling mirth
Of sun-split clouds . . . and done a hundred things
You have not dreamed of . . . wheeled and soared and swung
High in the sunlit silence. Hov'ring there.
I've chased the shouting wind along, and flung
My eager craft through footless halls of air.
Up, up the long, delirious, burning blue
I've topped the windswept heights with easy grace
Where never lark, nor even eagle flew.
And, while with silent, lifting mind I've trod
The high untrespassed sanctity of space,
Put out my hand, and touched the face of GOD.

— John Gillespie Magee Jr.

Air Force Reserve Officer Training Corps Program (AFROTC)

A minor in aerospace studies consists of satisfactory completion of the AFROTC program (16 upper-division units). Open to men and women.

Air Force ROTC is a college-based program whose primary goal is to provide students with a choice of well-paying, challenging and relevant positions after graduation. The few years of service will provide young officers with leadership experience that will be invaluable for either an Air Force or civilian career.

Two routes for an Air Force commission are available to college students in Air Force ROTC. Entering students may enroll in the four-year program, while students with at least two academic years remaining in college may apply for the two-year program.

The Air Force ROTC education program provides pre-professional preparation for future Air Force officers. It is designed to develop men and women who can apply their education to their initial active duty assignments as Air Force commissioned officers. In order to receive a commission, an Air Force ROTC cadet must complete all requirements for a degree in accordance with university guidelines as well as completing certain courses specified by the Air Force.

Air Force ROTC courses are taken for academic credit as part of student's electives. The two major phases of the curriculum are the General Military Course (GMC) and the Professional Officer Course (POC). In aerospace courses, all books, supplies, and uniforms are furnished at no cost to the student.

Air Force ROTC scholarships are available to qualified applicants in both the four- and two-year program. Each scholarship provides full tuition, laboratory and incidental fees, and a semester allowance for curriculum-required textbooks. In addition, scholarship cadets receive a nontaxable $100 subsistence each month during the school year. All two-year program cadets regardless of scholarship status also receive this monthly allowance.

Faculty and Facilities

The teaching staff in the Department of Aerospace Studies is composed of highly educated and experienced Air Force officers who are selected for their professional experience, academic background and instructor qualifications. Most of these officers have attended at least two Air Force schools in their particular fields and have received professional officer education at an Air University school. Completion of Air University's Academic Instructor School, the "teacher's college of the Air Force," and at least a master's degree is required.

Career Outlook

Although flying is the primary mission of the Air Force, it is not the only job that has to be done. Today, since science and technology are a large part of the national defense, the Air Force needs the best scientists and engineers the nation can produce. It also needs other professional men and women with a broad range of knowledge and skills. Many young officers who enter the Air Force today do not expect to be pilots or astronauts. They want to be part of the large research and development program of the vast support organization that keeps our country strong and progressive. Exciting job opportunities exist in a broad range of Air Force specialties. In addition to the recurring need for pilots, the Air Force also needs personnel to work in navigation, missile operations, engineering, mathematics, physics, computer science, and in the support fields of personnel, administration, logistics, finance, education, security police, health, and others. In the years ahead, Air Force ROTC will continue to concentrate on preparing men and women to assume important and responsible positions of leadership in the modern Air Force.

Faculty

Lt. Colonel Robert J. Seigel, *Chair*

Captain M. Dale Manners
Captain John W. Weiser

Advisers:
TSgt Terry V. Logan
SSgt James A. Depass

Eligibility for the General Military Course (GMC)

1. Be a full-time college student.
2. Be age 14 or older.
3. Be of good moral character.
4. Meet the medical standards for admission to CSU, Fresno.
5. Not have been disenrolled from an officer training program (a waiver of this requirement can often be obtained).

Eligibility for the Professional Officer Course (POC)

1. Be a citizen of the United States and not less than 17 years of age.
2. Be physically, mentally and morally qualified in accordance with standards established by the Department of the Air Force.
3. Have two academic years, either undergraduate or graduate, remaining at the time of POC entry.
4. Take the Air Force Qualifying Test.
5. (a) For pilot and navigator: Be not more than 26½ years of age at date of commissioning.
   (b) For all other categories: Be not more than 30 years of age (35 years for those with prior military service) at date of commissioning.
6. Be a full-time student according to the rules of CSU, Fresno.
7. Be approved for AFROTC training by the professor of aerospace studies.

COURSES

Aerospace Studies (A Sp)

1A–B. The Air Force Today (1–1). Courses must be taken concurrently with A Sp 3 Leadership Laboratory (one unit) if student desires an Air Force ROTC Commission. The Air Force in the contemporary world. The total force structure, strategic offensive and defensive forces, general purpose forces, and support forces.

2A–B. The Development of Air Power (1–1). Courses must be taken concurrently with A Sp 3 Leadership Laboratory (one unit) if student desires an Air Force ROTC Commission. The development of air power from balloons and dirigibles through contingency warfare and the peaceful employment of U.S. air power in relief missions.

3. Leadership Laboratory (1; max total 6). Must be taken each semester of the General Military Course (GMC). Cadets experiment with and develop their military and leadership skills and techniques.

The rapport that I had with my professors enabled me to understand, first hand, the advantages of having an ideal mentor. They demanded the best and went through many extra miles for me by assisting in extra research that often extended beyond class duties.

Harit K. Mehta
Alumnus from India, Corporate Planning Officer

5. Drill and Ceremony Fundamentals (1). The elements of military drill, individual and group precision movements, development of command voice; technical, stylistic and aesthetic aspects of creative drill maneuvers, and encompasses both rehearsal and public performance.

25. Air Force ROTC Field Training (3). Taken during summer preceding entry into POC. Six-week field training to acquaint student with Air Force life, basic military skills, weapons and support systems, and discipline. The Air Force provides meals, housing, pay, and travel to and from base.

103C. Air Force ROTC Field Training (3). For those completed GMC and prior-service cadets. Four weeks of training during any summer at Air Force installations. Physical training, drill, weapon familiarization, flying, orientation. The Air Force provides meals, housing, pay, and travel to and from base.

104A–B. Air Force Management and Leadership (3–3). Course must be taken concurrently with A Sp 113 Leadership Laboratory (one unit) if student desires an Air Force ROTC Commission. Systematic study of published research on leadership theories and group dynamics; review of the principles and functions of management with emphasis on problem solving and practical application of management tools; communication skills, military speech and writing formats.

105AW–BW. American Defense Policy (3–3). Course must be taken concurrently with A Sp 113 Leadership Laboratory (one unit) if student desires an Air Force ROTC Commission. (Students who have completed A Sp 104A-B and A Sp 105AW-BW will be deemed to have fulfilled the upper-division writing requirement.) An examination of the needs for national security; an analysis of the evolution of the American defense strategy and policy; an examination of the methods for managing conflict; an extensive study of alliances and regional security to preserve American interests around the world; an analysis of arms control and the threat of war; and a study of the formulation of American defense policy and strategy. Special topics of interest focus on the military as a profession, officership and the military justice system. Within this structure, continued emphasis is given to developing communicative skills.

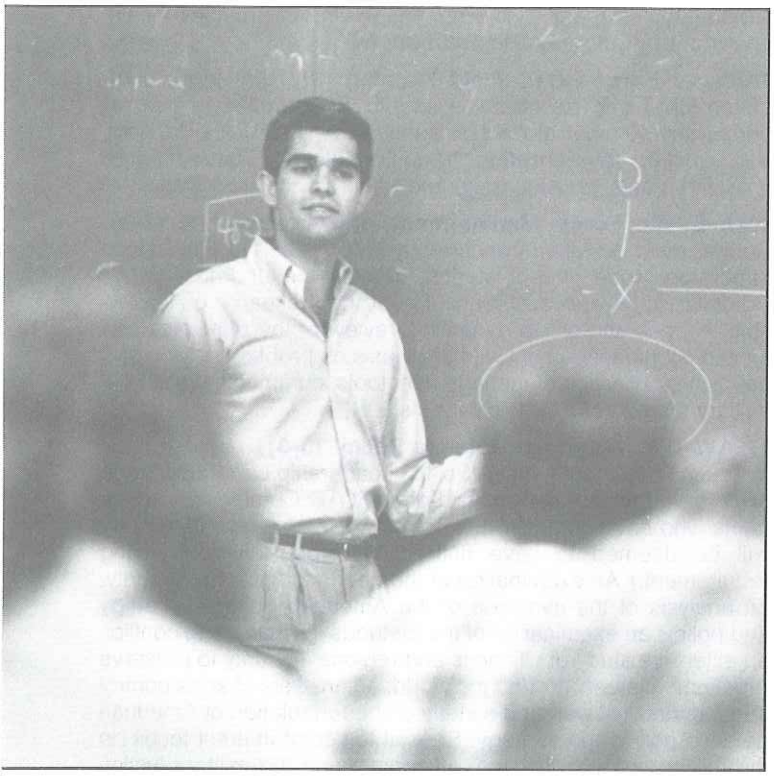
113. Leadership Laboratory (1; max total 6). Prerequisite: A Sp 25, or equivalent military training. Must be taken each semester of the Professional Officer Course (POC). Cadets experiment with and develop their leadership skills and techniques.

AGRICULTURE
Agricultural Economics

School of Agricultural Sciences and Technology
Department of Agricultural Economics
Dennis L. Nef, Chair
Leon S. Peters Building, Room 302
(209) 278-2949

B.S. in Agricultural Business
M.S. in Agricultural Business
Minor in Agricultural Business

Programs of Study:
- **Agricultural Economics**
- **Farm Management**
- **Agribusiness Management**
- **Food Industry Management**
- **Agricultural Marketing**
- **Agricultural Finance**
- **International Agriculture**



The award-winning Agricultural Business program at California State University, Fresno was recognized in 1985 as a national model by the Agribusiness Education Project, comprised of agricultural industry leaders and higher education scholars from around the country.

The agricultural business curriculum is taught by the faculty of the Agricultural Economics Department, which was established in 1970. Especially notable is the comprehensive and integrative program of study, with its problem-solving orientation and practical experience emphasis.

Degree Programs

The Bachelor of Science degree in Agricultural Business combines core undergraduate courses in agricultural economics (Ag Ec) with basic business management and agricultural science foundation courses. This undergraduate major allows you to emphasize a career specialty, such as concentrations in agricultural economics, farm management, agribusiness management, food industry management, agricultural marketing, agricultural finance, public policy and international agriculture, as well as agricultural communications, consumer science, animal sciences, plant science (plant, crop science, viticulture/tree fruit, ornamental horticulture, plant protection, soils/irrigation), agricultural engineering technology, enology, dairy industry, food science, meat science or nutrition. Certified minor programs of study are also possible in animal sciences, plant science, food and nutritional sciences, and agricultural engineering technology within the school.

The Master of Science degree in Agricultural Business combines core graduate courses in agricultural business (Ag Bs) with elective courses from business, agricultural economics, and the agricultural sciences. This graduate program of study is designed for those seeking to advance their career by enhancing their business management and economic analysis skills.

Instructional Facilities

Modern agricultural computing facilities are used to teach students computerized farm accounting systems, agricultural enterprise management, agribusiness simulations, statistical analysis programs, plus planning and decision-making aids as part of their professional expertise.

All agricultural business students have access to a commodity market news service in the Marketing News Center and to a computerized data base system of 16 menu categories containing more than 500 files through the statewide Advanced Technology Information Network (ATI-NET) established by the school's California Agricultural Technology Institute (CATI).

Career Opportunities

Graduates of the Agricultural Business program can choose from more than 120 professional occupations in California's agricultural industry. Ask your faculty adviser for the agricultural business career opportunities list.

Professional Preparation

While a student at CSU, Fresno, you may establish credibility with prospective employers by participating in the following occupationally related activities:

Career planning and preparation in the Agribusiness Career Seminar (Ag Ec 195);

National Agri-Marketing Association (NAMA) student chapter, which serves as the Agricultural Business Club — offering professional contacts with industry leaders and involvement in the yearly national marketing competition for academic credit (Ag Ec 168);

Industry internship opportunities for many career positions through management training programs with agricultural business firms and support institutions — the department awards internships on a competitive basis each semester and summer, and grants academic credit for this supervised experience (Ag Ec 194);

Farm laboratory experience under faculty supervision through participation in the student project program and concurrent enrollment in an Enterprise Management course (Plant, A Sci, Enol 196).

Faculty

Dennis L. Nef, *Chair*

David K. Smith, *Graduate Coordinator*

Juan C. Batista
James H. Cothern
Thomas I. Gunn
John W. Hagen
Herbert O. Mason
Carl L. Pherson
Claudia J. Sersland
John R. Shields
David K. Smith
Douglas R. Williams

Faculty members are broadly trained with advanced degrees from top ranked universities across the nation and are highly experienced as teachers, consultants and researchers. They bring practical insight to the classroom by being professionally active in service to California farms and agribusinesses, industry organizations, government agencies and professional associations. Forming a strong advisee-adviser relationship with any one of the faculty can help you match your career goals with appropriate coursework.

Bachelor of Science Degree Requirements
Agricultural Business Major

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  - Category 3: Ag Ec 71 (required)
- BREADTH
  - Division 1: Chem 3A (required)
  - Division 2: Biol 10, Bot 10, or Zool 10 (required)
  - Division 3: Psych 10 (recommended)
  - Division 4: CFS 38 or FScN 53 (recommended)
  - Division 8: Ag Ec 1 (required)
- CAPSTONE
  - Agriculture and Government Policy Cluster (recommended): Ag Ec 150 and Phil 125 or Pl Si 150

Major (including 20 upper-division units) 60
- Agricultural Science Foundation ..... (12)
  - (In addition to the Ag Ec requirement, select one course from three of the five remaining areas)
  - Ag Ec: Ag Ec 2 (required)
  - A Sci: A Sci 1
  - FScN/Dairy/Enol: FScN 50, 54, D Ind 23, or Enol 15
  - AET: AET 1 or 2
  - Plant Sci: Cr Sc 1, VTF 1, OH 1, or Pl Pr 1
  - SI: SI 1
- Business Management Base ..... (15)
  - B A 18 or Ag Ec 28
  - Acct 4A or Ag Ec 31
  - Acct 4B or Ag Ec 32
  - DS 73 or Ag Ec 71
  - IS 50 or Ag Ec 76
- Agricultural Economics Core ..... (21)
  - Ag Ec 100, 110, 120, 130, 160, 170, 3 unit upper-division Ag Ec course
- Career Specialty ..... (12)
  - A required concentration of approved courses (including a minimum of 6 upper-division units in agricultural economics) is selected to match the student's career goal in consultation with the student's assigned faculty adviser. (See major program of study check sheet for course listings by concentrations in various disciplines.)

Additional requirement 1–3
- Upper-division writing skills (by exam or Plant 110W)

Electives 14–16
- (Courses supplementary to the major are strongly recommended)

Total requirements (including 40 upper-division units) 128

Advising Notes:

1. New students should request the program of study check sheet from the department.
2. All students should make an appointment with their assigned academic adviser prior to registration each semester.
3. Community college transfer students should consult their academic adviser to determine which CSU, Fresno Ag Ec courses are articulated for credit as equivalent to their community college courses.
4. Credits earned for articulated community college courses do not count toward the minimum requirements of 20 upper-division units in the major and 40 upper-division units for the degree.
5. *CR/NC* grading is not permitted for courses included in the major. Internship units for Ag Ec 194, which is graded on a *CR/NC* basis, can be counted under the Electives category.
6. General Education courses designated as additional requirements by the department are prerequisite to many courses in the program of study but may not be double counted to simultaneously satisfy Major as well as General Education requirements.
7. The General Education CORE requirement in mathematics within Category 3 should be satisfied during the first year in residence at CSU, Fresno. If Ag Ec 71 is taken in Category 3, another 3 unit Ag Ec course must be taken in its place within the major.
8. The General Education BREADTH courses required of agricultural business students within Division 1, 2 and 8 should be completed by the end of the first semester of the sophomore year.
9. The General Education CAPSTONE cluster courses recommended for agricultural business students are Ag Ec 150 and Phil 125 or Pl Si 150, both of which can be taken only after 56 degree units are completed. The Agriculture and Government Policy CAPSTONE choice would appropriately be taken during the senior year.
10. The General Education requirement of 51 units may be exceeded depending upon the selection of courses; such excess units are counted under the Electives category toward the 128-unit degree.
11. Upper-division units (i.e., 100-level courses) may not be applied toward the 40 upper-division unit degree requirement until 45 units have been completed.
12. All upper-division agricultural economics courses have prerequisites to which students must adhere; however, equivalent prerequisite courses may be substituted.
13. The Agricultural Science Foundation courses should be completed no later than the end of the first semester of the junior year.
14. The Business Management Base courses should be completed no later than the end of the first semester of the junior year.
15. The Agricultural Economics Core courses of Ag Ec 100, 110, 120, 130 and 160 should be completed no later than the end of the junior year. In particular Ag Ec 100 should be taken

immediately upon completion of 45 units, including the prerequisite course Ag Ec 1, and preferably before the other Ag Ec core courses. Ag Ec 170 and the 3 unit upper-division Ag Ec course should be taken during the senior year.

16. The Program of Study Career Specialty within the major (identified by the major code number in the *Schedule of Courses*) consists of approved courses totaling 12 units (of which 6 must be upper-division units in agricultural economics) under a formally recognized concentration (see program of study check sheet) or an individually tailored flexible group of logically integrated courses to meet the student's particular career goal.
17. Required Ag Ec courses are normally offered fall and spring semesters; elective Ag Ec courses are usually offered either fall or spring semester.
18. Students planning to earn a Master of Science degree in Agricultural Business at CSU, Fresno should include approved courses in inferential statistics, linear regression, quantitative analysis and organizational behavior in their bachelor's degree program.
19. Students intending to pursue graduate study in agricultural economics at another institution should include approved courses in intermediate macro-economic theory, differential and integral calculus, inferential statistics and linear regression in their bachelor's degree program.
20. The upper-division writing skills requirement can be met by passing the university Upper-Division Writing Examination (UDWE) or by taking an approved upper-division writing skills course only after 56 units are completed. One unit of credit in Engl 100W may be earned for passing the examination if requested by the student; by obtaining a letter grade of *C* or higher in an approved course (e.g., Plant 110W), the student will meet the upper-division writing skills requirement.
21. A dual major of agricultural business and agricultural science (e.g., animal and plant science or production options) must have 36 mutually exclusive units (including a minimum of 18 upper-division). A dual major requires the approval of the department chairs administering these programs of study. General Education and Elective units may be applied (i.e., double counted) toward a second major or a minor. (See *Dual Major or Minor* in this catalog and consult with the appropriate department adviser.)
22. Complete the Certification of Major Requirements form in consultation with your assigned academic adviser; and submit it to the department chair for approval during the next-to-last semester in residence. File an application for graduation early in your last semester and pay the required application fee.

Agricultural Business Minor

This minor field of study is principally designed for agricultural science and business majors. Those students majoring in animal, plant, and food sciences or agricultural engineering technology may seek to complement their technical knowledge with competencies in agricultural business for professional advancement. Students majoring in one of the business degree options may anticipate staying in the San Joaquin Valley where they will most likely become involved with and require an understanding of the agricultural sector as employees, clients or customers of agribusiness firms. The minor also provides a foundation for graduate study in agricultural business or agricultural economics.

You should consult with your faculty adviser in the Agricultural Economics Department to plan your program. The adviser and the department chair must approve the minor program of study before it can be certified by the school dean, filed with the Office of Evaluations and recorded on your transcript.

The minor consists of 24 units, of which equivalent courses are acceptable for 12 units.

Core Requirements	*Units*
Intro Microeconomics: Ag Ec 1	3
Financial Accounting: Ag Ec 31	3
Financial Principles: Ag Ec 130	3
Organizational Behavior: Ag Ec 120	3
Production Operations: Ag Ec 110N/110 or Ag Ec 124	3
Agricultural Marketing: Ag Ec 160	3
Government Policy: Ag Ec 150	3
Focus Elective (Agri Science Majors: Agri Economics (upper division) Business/Other Majors: Agri Science)	3
	24

Advising Notes

1. University policy states that courses fulfilling requirements for a minor may be counted toward General Education (e.g., Ag Ec 1 or Econ 40 in BREADTH Division 8; Ag Ec 150 in CAPSTONE).
2. The department waives the CORE requirements of Ag Ec 1, 31, 130 and 120 for students who have already received credit for Econ 40, Acct 4A, Fin 120, and Mgt 104 or 110 respectively. Such course waivers correspondingly reduce the unit requirement for the minor from the maximum of 24 to a possible 12 — the minimum allowable under the Title 5 code. This adjustment accommodates the university policy that "courses in a major cannot be applied toward a minor unless designated as 'additional requirements' to the major."
3. Concerning the course selections to satisfy the production operations core requirement and the focus elective, consult with the minor adviser about which choices match your career plans.
4. All courses in the minor must be taken for a letter grade; *CR/NC* grading is not acceptable.

Master of Science Degree Requirements

The Master of Science in Agricultural Business (MSAB) is a 30-unit program designed to develop business management and economic analysis skills for individuals seeking career advancement in farm management, agribusiness management, agricultural finance, and agricultural marketing. Applicants are normally expected to have postbaccalaureate degree work experience in the agricultural sector in order to fully participate in and benefit from classroom seminars stressing the integration of theory and practice through the application of research knowledge to industry problems. Most graduate courses are offered in the evening to accommodate students who are employed full time.

Admission Criteria

Full classified standing requires a baccalaureate degree in agricultural science, agricultural business, business, economics or related undergraduate major from an accredited institution; a 3.0 GPA (last 60 semester units); and either a 450V/430Q Graduate Record Examination (GRE) score or a 500 Graduate Management Aptitude Test (GMAT) score.

Conditional classified standing may be granted by the department to petitioning applicants with a 2.5 to 2.99 undergraduate GPA (last 60 units), if they have obtained a passing score on either the GRE or GMAT and if two letters of recommendation from past or current employers attesting to the applicant's intellectual maturity and relevant experience have been received by the department. Such students will be fully classified only when all prerequisite foundation courses taken at the undergraduate level have been completed with a minimum 3.0 GPA. Prerequisite foundation courses are not included in the 30-unit degree program.

Foreign students: Applicants whose preparatory education was principally in a language other than English must earn a minimum score of 550 on the Test of English as a Foreign Language (TOEFL).

Note: For complete information on admission requirements and application procedures see *Division of Graduate Studies and Research.*

Prerequisite Courses

The following specific prerequisite foundation courses, or their equivalents, are expected to be completed prior to enrollment in graduate level agricultural business (Ag Bs prefix) or business (Bus prefix numbered 221 and higher) courses:

Agricultural Sciences

Three courses from at least two of the agricultural programs:

Animal Science; Dairy Industry, Enology, Food Science, and Nutrition; Plant, Crop Science, Viticulture/Tree Fruit, Ornamental Horticulture, Plant Protection, Soils/Irrigation, and Agricultural Engineering Technology.

Economic Theory

Introductory Microeconomics: (Ag Ec 1 or Econ 40 or Bus 202)
Introductory Macroeconomics: (Ag Ec 2 or Econ 50 or Bus 202)
Intermediate Microeconomics: (Ag Ec 100 or Econ 100A or B A 100)

Agricultural Economics

Farm Management: (Ag Ec 110)
Business Management: (Ag Ec 120 or POM 124 or Bus 216)
Finance Principles: (Ag Ec 130 or Fin 120 or Bus 218)
Agricultural Marketing: (Ag Ec 160)

Business Foundation

Accounting Principles: (Bus 205 or Acct 4A-B)
Business Mathematics: (Bus 207 or DS 71–72)
Statistical Methods: (Bus 208 or DS 73 and 173 or Ag Ec 71 and DS 173)
Computer Programming: (Bus 209 or IS 50 or Ag Ec 76)
Business Law: (Bus 211 or B A 18 or Ag Ec 28)
Organizational Behavior: (Bus 214 or Mgt 110 or Mgt 104 and 106)

Note: Courses prefixed *Ag Bs* or *Bus* are open only to graduate students with full classified standing.

Program Requirements

All students must complete an agricultural business base, three elective graduate courses from the School of Business and Administrative Sciences, an agricultural elective and a culminating experience. The agricultural business base consists of five graduate courses (Ag Bs prefix). Research projects are required in each agricultural business base course to allow students to develop skills in critical analysis of agribusiness problems employing appropriate research methodology and methods. Additionally, students may focus their program to meet career goals by selection of approved electives in consultation with an adviser. Among the electives from the School of Business and Administrative Sciences (Bus prefix), graduate courses in organizational principles and marketing management are recommended for most students. In addition to the above, there are two options for meeting the culminating experience requirement. The research plan requires a thesis or project. The comprehensive examination plan requires an additional approved elective and an examination. Specific program elements are:

Research Plan	*Units*
Agricultural Business Base Ag Bs 210 or 225, 220, 230, 250, 260	15
Business Electives Three approved graduate courses (Bus 241 or higher); Bus 241 and Bus 242 (recommended)	9
Agricultural Elective One approved graduate course in Agricultural Business (Ag Bs), upper-division undergraduate course in Agricultural Economics (Ag Ec), or a graduate/upper-division course in agriculture	3
Research Culminating Experience Ag Bs 298 or 299 (See Advising Note 9)	3
Total requirements	30

Comprehensive Examination Plan	*Units*
Agricultural Business Base Ag Bs 210 or 225, 220, 230, 250, 260	15
Business Electives Three approved graduate courses (Bus 241 or higher); Bus 241 and Bus 242 (recommended)	9
Agricultural Electives Two approved courses in Agricultural Business (Ag Bs), upper-division undergraduate courses in Agricultural Economics (Ag Ec), or graduate/upper-division courses in agriculture	6
Culminating Experience Comprehensive examination	0
Total requirements	30

Advising Notes:

1. Students should obtain specific information concerning the MSAB degree program and "MSAB Advisee Check Sheet" from the department office.
2. Before enrolling in courses, students should see the department graduate coordinator for aid in program planning and selecting a faculty adviser.
3. See *Division of Graduate Studies and Research* section in this catalog for university regulations governing the fulfillment of master's degree requirements.
4. In order to continue graduate enrollment the student must maintain a 3.0 GPA and demonstrate satisfactory progress through the degree program. (See *Division of Graduate Studies and Research* for time limitations.)
5. The sequence of steps necessary to complete the degree is:
   a. Complete all prerequisite foundation coursework.
   b. Attain classified standing.
   c. Pass an oral diagnostic examination.
   d. Meet the graduate writing skills requirement.

e. Consult with graduate coordinator regarding procedures and guidelines for the Research Plan and the Comprehensive Examination Plan, choose a plan, and petition for advancement to candidacy as soon as eligible.
f. Complete the agricultural business base.
g. Maintain a 3.0 GPA.
h. If pursuing the Comprehensive Examination Plan, schedule the examination for the end of the semester in which courses are to be completed, and complete the culminating experience.
i. If pursuing the Research Plan, formally present a project or thesis proposal and file a project or thesis committee assignment form before the semester in which you will enroll in 298 or 299; complete the research and defend the results.

6. The oral diagnostic examination may be waived for students with superior academic preparation in the MSAB prerequisite course requirements. (See graduate coordinator for criteria and petitioning process.)
7. Advancement to candidacy requires full classified standing, successful completion of 9 program units in residence, maintenance of a 3.0 GPA, meeting the graduate writing skills requirement, fulfillment of departmental requirements, and filing a petition for advancement to candidacy a minimum of one semester prior to enrollment in the thesis or project within the deadline.
8. The graduate writing skills requirement will be met by earning a minimum of 450 verbal on the GRE. Students achieving a minimum of 500 on the GMAT may meet the graduate writing skills requirement by earning a score of 80 or higher on the university writing competency examination or by earning a *B* or better in a designated W course to be specified by the graduate committee of the School of Agricultural Sciences and Technology.
9. Students undertaking the Research Plan may register for a maximum of 6 units of Ag Bs 298 or 299 project or thesis. Such students are required to complete a minimum of 33 units instead of the normal 30 units wherein only 3 units of Ag Bs 298 or 299 is taken.

COURSES

Note: Active immunization against tetanus (available through Student Health Services) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the University Farm.

Note: Cost to the student of extended field trips will vary each semester depending upon itinerary. Student should ask the course instructor.

Economic Principles (Ag Ec)

1. Introductory Agricultural Economics (3). Microeconomic principles of resource allocation, production, cost analysis and market price equilibrium with primary application to farms and agribusiness firms; supply and demand in commodity pricing under perfect and imperfect competition; survey of agricultural management and marketing problems and issues. General Education BREADTH, Division 8.

2. Agricultural Sector Analysis (3). Domestic and international forces affecting industry profitability of farm input suppliers, agricultural producers, commodity processors, food marketers; government fiscal, monetary, trade policies interaction with agricultural credit, price support, food subsidy programs; impact on agribusiness asset values, debt accumulation, income levels.

100. Intermediate Agricultural Economics (3). Prerequisite: Ag Ec 1 and Intermediate Algebra. Microeconomic theory of agricultural production in factor-product, factor-factor, product-product decisions; production costs and economies of size; consumer choice theory; price and output determination under imperfectly competitive markets; marginal productivity theory and the derived demand for agribusiness inputs.

Farm Management (Ag Ec)

110N. Introductory Farm Management (3). Prerequisite: Ag Ec 1. Survey course for Non-Agricultural Business majors. Introduction to applied economics and farm business management topics: farm accounting, financial statement analysis, management principles, computer assisted decision aids, animal and crop enterprise budgeting, farm business planning, tax management, investment analysis, agricultural finance. (2 lecture, 3 lab hours)

110. Farm Management (3). Prerequisite: Ag Ec 100. Production economics and management techniques for analysis of efficient farm resource use, planning and organization; analysis of budgeting and optimization techniques, and computer applications for developing farm management plans. (2 lecture, 3 lab hours)

114. Advanced Farm Management (3). Prerequisite: Ag Ec 110. Design, computerization and analysis of profit maximizing, cost minimizing and multi-period linear programming models; risk and uncertainty; data and information requirements for decision making; optimizing the level and mix of crop and livestock enterprises; development of farm management plans.

117. Agricultural Labor-Management Relations (3). Prerequisite: Ag Ec 1. Economic analysis of the farm labor market; labor productivity, agricultural mechanization and farm employment; farm labor laws and government regulations; agricultural labor relations, unionization, and collective bargaining; farm personnel administration practices and supervisory management principles.

Agribusiness Management (Ag Ec)

28. Introductory Agricultural Law (3). Fundamentals of agricultural business law including historical sources and development; legislative laws; administrative regulations, judicial decisions affecting agriculture; express and implied contracts with remedies for their breach in agricultural situations; real and personal property law plus secured transactions in agriculture. (Former Ag Ec 185T section)

120. Agribusiness Management (3). Prerequisite: Ag Ec 1. Organizational forms and management functions of agribusiness firms; human resource management systems; management science principles for optimizing plant location, equipment replacement, inventory control, and sales volume; operations research techniques, including probability-based network and decision models, for solving agribusiness problems.

122. Agricultural Cooperative Management (3). Prerequisite: Ag Ec 120. Philosophical, historical and legislative evolution of U.S. agricultural cooperatives; uniqueness of cooperative organization, planning, direction and control functions vis-a-vis standard corporations; legal, financial and tax considerations in managing input-supply and marketing cooperatives; case studies and field trips to cooperatives.

124. Food and Fiber Industry Management (3). Prerequisite: Ag Ec 1. Production management of farm input manufactures, agricultural commodity processing, food/fiber product distribution; functional approach to transformation/value-added operations including planning, organizing, directing, coordinating, controlling; case applications to materials handling, product development, food packaging, quality control, transportation logistics, inventory management.

128. Advanced Agricultural Law (3). Prerequisite: Ag Ec 28 or B A 18. Case applications of agricultural business law; torts covering trespass, negligence, liability for farm livestock and chemicals; surface and mineral property rights; water law; farm labor law; agribusiness firm incorporation; agricultural cooperative regulation; state and federal marketing orders; farm estate taxation.

Financial Planning (Ag Ec)

31. Farm Accounting (3). Basic concepts and principles of financial accounting systems applied to farm operations; mechanics of recording single and double entry transactions under cash and accrual accounting methods; preparation and analysis of enterprise records and financial statements to generate management information. (2 lecture, 3 lab hours) (Former Ag Ec 30)

32. Agribusiness Managerial Accounting (3). Prerequisite: Ag Ec 31 or Acct 4A. Application and analysis of accounting information for farm and agribusiness management; integration of economic and financial principles in preparing business plans; equipment cost control and crop enterprise accounting methods; capital investment and profit performance; introduction to computerized farm accounting systems. (2 lecture, 3 lab hours) (Former Ag Ec 185T section)

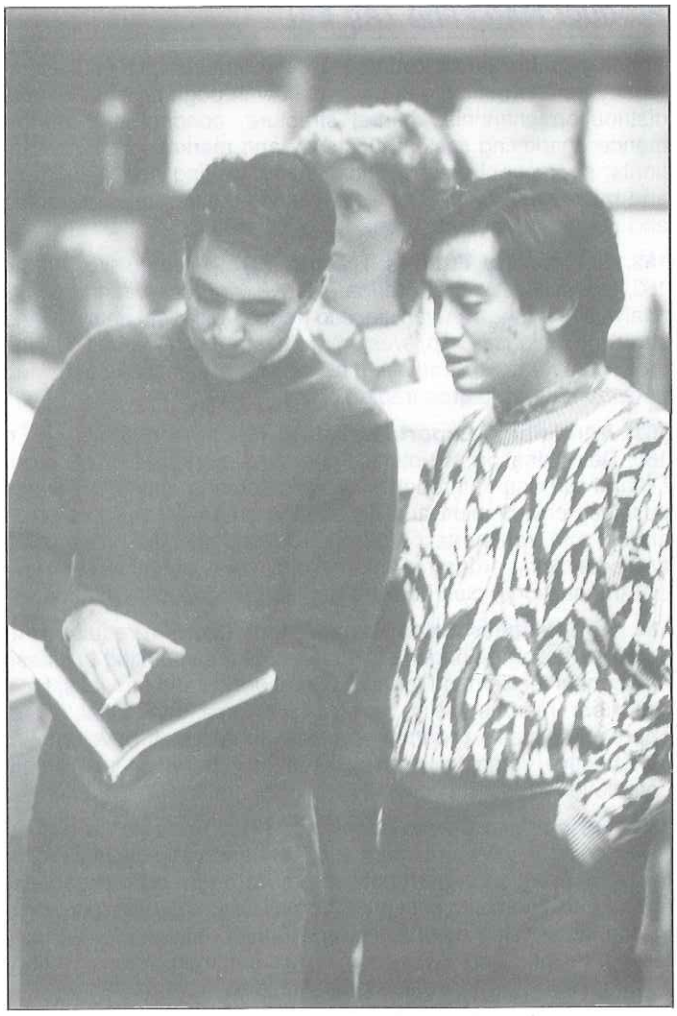
130. Agricultural Finance (3). Prerequisite: Ag Ec 1, and Ag Ec 31 or Acct 4A. Analysis of farm financial statements; legal instruments of financial transactions; institutional sources of farm credit; time value of money and capital budgeting for agricultural investment; cost of debt and equity capital; risk management strategies; insurance, tax and farm estate planning.

136. Farm and Ranch Appraisal (3). Prerequisite: Ag Ec 1; Ag Ec 110 or 110N (recommended). Principles of agricultural appraisal; physical and economic factors affecting land values; estimation of real estate value using income, cost and market data approaches; case studies and field problems involving the valuation of local farm and ranch properties.

Agricultural Development (Ag Ec)

140. International Agricultural Development (3). Prerequisite: Ag Ec 1. Agricultural sector development and national economic growth in low income countries; research, extension and policy strategies for transforming subsistence farmers into commercial growers; foreign aid efforts addressing food deficits, malnutrition, overpopulation, rural underemployment, environmental degradation, inappropriate technology and capital shortages.

147. Rural Development Administration (3). Prerequisite: Ag Ec 140. Application of public administration and business management principles to directing international agricultural technical assistance; infrastructure development, institution building, policy formulation, technology transfer, and rural entrepreneurship in market-oriented and state-planned economies; program planning, project supervision and contract management overseas.



Public Policy (Ag Ec)

150. Agricultural Policy (3). Prerequisite: Ag Ec 1. Analysis of public policies affecting the economic position of U.S. and California agriculture; government programs influencing agricultural production, commodity distribution, market prices and farm income; selected topics concerning American food and fiber system; comparative foreign agricultural policies and U.S. trade. General Education CAPSTONE Cluster, Critical Thinking.

153. Agricultural Trade (3). Prerequisite: Ag Ec 150. Comparative advantage, trade models, protectionist barriers and balance of payments; world agricultural trade patterns and international commodity agreements; domestic farm programs and foreign trade policies; surplus food aid and concessionary sales overseas; trade liberalization versus preferences issue and economic development.

155. Natural Resource Economics (3). Prerequisite: Ag Ec 1. Economic analysis of public policies governing land use, water management, energy generation, mineral exploitation and forest administration; review of population pressures and resource conservation; examination of externalities, property rights issues, resource use planning, agricultural zoning, environmental regulations and reclamation law.

Product Marketing (Ag Ec)

160. Agricultural Marketing (3). Prerequisite: Ac Ec 1. Commodity transformation and product flow through processing and distribution channels; market structure, conduct and performance; marketing system efficiency and marketing bill components; over supply, marketing orders, grading and standards, and price stabilization; price forecasting, futures market trading and risk management. (Former Ag Ec 161)

162. Commodity Futures Trading (3). Prerequisite: Ag Ec 160. Speculation and the price discovery process; fundamental analysis and long-run decisions to hedge; technical analysis and short-run timing of crop/livestock sales; trend line charts utilizing moving averages; trading mechanics, price projection and development of futures trading plans.

163. Agricultural Export Marketing (3). Prerequisite: Ag Ec 160. Determination of potential overseas markets for U.S. agricultural products through export marketing studies; foreign business environment and distribution channels; product preparation and transportation abroad; cultural-specific promotional and advertising programs; international sales agreements, financial transactions, plus banking and shipping documentation.

164. Agribusiness Sales Management (3). Prerequisite: Ag Ec 1. Marketing management strategies for stimulating business and consumer demand for agricultural goods and services; food and fiber merchandising using institutional, functional, value approaches; sales program organization and staff development for effective communication of product information and timely completion of transactions.

166. Agricultural Communications (3). Prerequisite: Ag Ec 1. Agricultural news and information gathering and dissemination to food producers and consumers through print/broadcast media and computer networks; formulation of promotional programs, advertising campaigns, and public relations for agricultural industries and institutions; mass communications writing, editing; simulated videotape presentations.

168. Agricultural Marketing Management Project (1–3; max total 3). Prerequisite: Ag Ec 71, 164 (or equivalent) and permission of instructor. Marketing management principles in preparing marketing plan for annual National Agri-Marketing Association intercollegiate competition; strategic planning for product development, sales projections, distribution channels, pricing tactics, promotion/advertising, market share analysis; focus group, survey research, oral/audio-visual team presentation. (2 activity hours per unit)

Decision Analysis (Ag Ec)

71. Agricultural Business Statistics (3). Prerequisite: Intermediate Algebra. Application of descriptive statistics to analyze agricultural sector conditions; measures of central tendencies and dispersion, time series analysis, index numbers, seasonal variation, data collection and presentation, introduction to probability theory, and discrete and continuous probability distribution. General Education CORE, Quantitative Reasoning.

76. Agribusiness Microcomputer Applications (3). Prerequisite: Intermediate Algebra. Applied microcomputing for agribusiness management. Evaluation of alternative microcomputing systems and software. Use of an electronic spreadsheet and data base management programs; applications to farm accounting, crop and livestock enterprise management, and agricultural financial planning. (2 lecture, 3 lab hours) (Former Ag Ec 185T section)

170. Agribusiness Research Methods (3). Prerequisite: Ag Ec 71 or DS 73, Ag Ec 76 or IS 50, and Ag Ec 100; Upper-Division Writing Skills requirement. Research methods applied to agricultural business; problem definition, hypothesis formulation, research design, data collection, and results analysis using descriptive and inferential statistics; mechanics of writing research proposals and technical reports and making oral presentations of findings.

174. Agricultural Systems Analysis (3). Prerequisite: Ag Ec 71 or DS 73, and Ag Ec 76 or IS 50. Systems science principles for agribusiness planning and controlling decisions; logic and probability in diagnosing problems, designing operations, and achieving objectives with general and subsystems models; identification of elements, relationships, and procedures for efficient input/output transformation; applications to computer programming. (Former Ag Ec 178)

Special Topics (Ag Ec)

80. Undergraduate Research (1–4; max total 4). Prerequisite: Ag Ec 1 and permission of instructor. Directed study or research on particular problems in the field of agricultural economics and business. Consult department policies and procedures governing undergraduate research. Approved for *SP* grading.

85T. Topics in Agricultural Business (1–3, max total 6). Agricultural economics, farm management, agribusiness management, financial planning, agricultural development, public policy, product marketing and decision analysis. Topics may require lab hours.

180. Undergraduate Research (1–4; max total 4). Prerequisite: Ag Ec 170 and permission of instructor. Directed study or research on particular problems in the field of agricultural economics and business. Consult department policies and procedures governing undergraduate research. Approved for *SP* grading.

185T. Topics in Agricultural Business (1–3, max total 9). Prerequisite: Ag Ec 1. Agricultural economics, farm management, agribusiness management, financial planning, agricultural development, public policy, product marketing and decision analysis. Topics may require lab hours.

Industry Relations (Ag Ec)

192. Agricultural Business Field Studies (2). Prerequisite: Ag Ec 1. Business and economic functions performed by specialized agricultural agencies with emphasis on physical operating patterns. Field trips to production, marketing and finance firms. Workshops with agribusiness managers. (Field trip fee, up to $75) (1 lecture, 2 lab hours)

194. Agribusiness Internship (1–8; max total 8). Prerequisite: junior or senior standing and approval of internship committee. Emphasis on development of decision-making ability through industrial experience integrated with basic principles acquired in the classroom. *CR/NC* grading only.

195. Agribusiness Career Seminar (1). Prerequisite: junior standing or permission of instructor. Career exploration and academic preparation in agribusiness; assessment of personal and professional skills matching agricultural occupational choices; career planning, self-marketing strategies, and job-hunting tactics; resume and letter writing, interview and job-offer negotiations; workshops with industry representatives.

GRADUATE COURSES

(See *Course Numbering System and Eligibility*)

Agricultural Business (Ag Bs)

200. Seminar in Agricultural Business (1; max total 4). Prerequisite: permission of instructor. Written and oral reports concerning recent literature on current problems and issues related to agricultural business.

210. Farm Management Analysis (3). Prerequisite: Ag Ec 100 and 110. Integration of production economics theory with management science techniques to develop farm management plans; analysis of farm management decisions under uncertainty using programming models, statistical analysis and other operations research methods.

220. Agribusiness Management Analysis (3). Prerequisite: Ag Ec 120. Diagnosis of management problems in terms of planning, controlling, directing, organizing and staffing functions; management science techniques for decision making under certainty and uncertainty using deterministic and probabilistic models; case study assessment of organizational behavior theory and operations research methodology.

225. Food Processing and Distribution Management (3). Prerequisite: Ag Ec 124 or permission of instructor. Analysis of strategic management decisions involving pricing relationships, processing and packaging systems, transportation modes and distribution logistics for agricultural products in domestic and global markets; application of modern management tools to food industry case problems including operations of international food marketing firms.

230. Agricultural Finance Analysis (3). Prerequisite: Ag Ec 130 or Fin 120 or Bus 205. Application of advanced portfolio theory, capital asset pricing models and capital budgeting procedures to decision making under uncertainty for farming operations and agricultural businesses; case studies illustrating data base management, tax management and optimal capital asset replacement scheduling.

240. Agricultural Sector Planning (3). Prerequisite: Ag Ec 130 or Fin 120, Ag Bs 250. Economic policies, incentive structures and resource constraints affecting agricultural development; rural development theories, growth models and sector strategies for increasing farm productivity; design, implementation and evaluation of technical assistance programs; economic and financial appraisal of public and private investment projects.

250. Agricultural Policy Analysis (3). Prerequisite: Ag Ec 100. Exploration of policy-making processes; evaluation of government farm and food programs; determination of industry responses and firm adjustments to changing market structures and public policies; investigation of agricultural sector problems, issues and linkages with the national and international economies.

260. Agricultural Marketing Analysis (3). Prerequisite: Ag Ec 160. Examination of demand and supply functions underlying market price determination; review of farm-retail marketing margins; analysis of spatial and intertemporal price equilibrium models; application of econometric techniques to empirical cases; preparation of marketing studies; development of distribution/merchandising strategies.

I want students to be constantly aware of life's unfolding opportunities and to always maintain the ability to choose the best possible path consistent with their values and goals. After all, that's what my field of economics is all about — the science of making optimal choices.

John R. Shields
Professor, Agricultural Economics

265. Agricultural Price Forecasting (3). Prerequisite: Ag Bs 260. Specification of demand and supply equations; regression analysis of agricultural price forecasting models; estimation of price, income and cross elasticities and price flexibility coefficients; analysis of price trends and cyclical price variations; advanced hedging and speculation in commodity futures trading.

270. Research Communications in Agribusiness (3). Prerequisite: advancement to candidacy. Individually directed readings in a field of special concern to the student's graduate program; appropriate research proposal writing and evaluation required.

280T. Topics in Agricultural Business (3; max total 6). Prerequisite: upper-division agricultural economics courses appropriate to the topic. Fields of study include: farm management, agribusiness management, financial planning, agricultural development, public policy and product marketing.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

298. Project (3–6; max total 6). Prerequisite: prior advancement to candidacy; see *Criteria for Thesis and Project*. Management audit of an operating agricultural business firm, replicated feasibility study, computer model, system simulation or similar professional problem-solving activity with extensive written documentation. Public presentation of proposal and seminar, plus final oral defense required. Approved for *SP* grading.

299. Thesis (3–6; max total 6). Prerequisite: prior advancement to candidacy; see *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE *(Agri)*

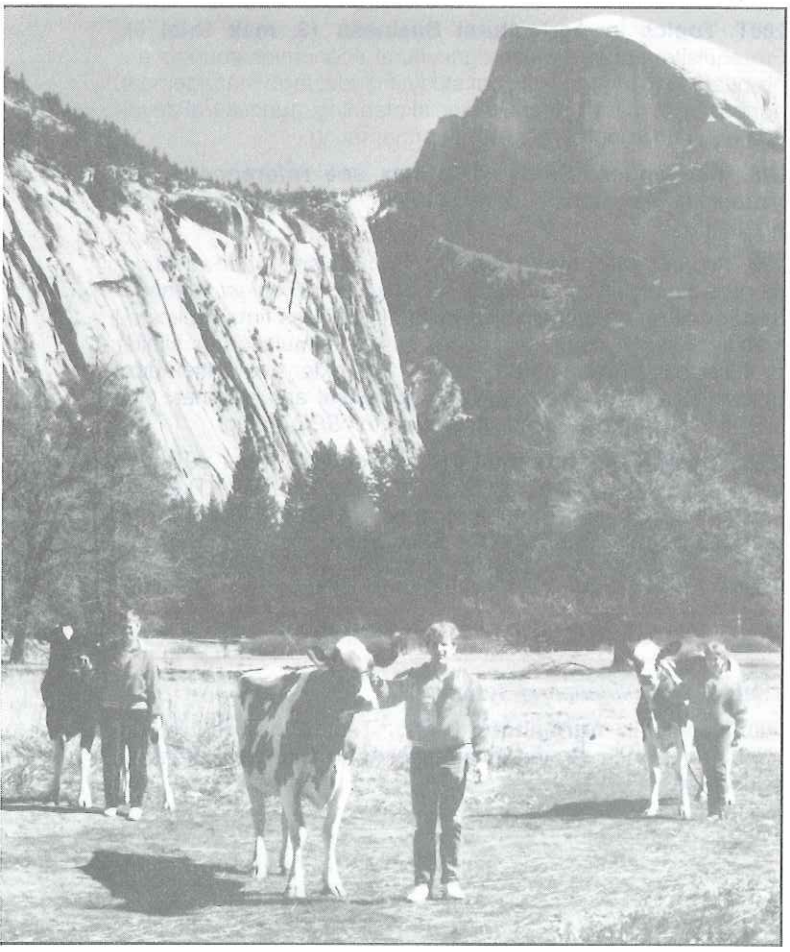
(See *Course Numbering System.*)

300. Topics in Agriculture (1–3). Topics may require lab hours. In-service professional training in selected areas of agriculture.

AGRICULTURE
Animal Sciences and Agricultural Education

School of Agricultural Sciences and Technology
Department of Animal Sciences and Agricultural Education
Scott A. Williamson, Acting Chair
Agriculture Building, Room 230
(209) 278-2971

B.S. in Animal Sciences
Options: Basic Animal Science
Dairy Science
Meat Technology
Preveterinary Medicine
Production Management
B.S. in Agricultural Education
Options: Agricultural Communications
Teacher Preparation
Minor in Animal Sciences
M.S. in Agriculture
Option: Animal Science



Options offered by the Department of Animal Sciences and Agricultural Education include agricultural communications, teacher preparation, basic animal science, dairy science, meat technology, preveterinary medicine and production management. Courses integrate animal evaluation, behavior, disease, environmental management, genetics, health, marketing, muscle biology, nutrition, physiology, production and reproduction.

The Agricultural Education Major is designed to prepare students for positions as agricultural communication specialists and vocational agriculture teachers. Specializations may be developed in animal sciences, plant sciences or agriculture.

Instructional Facilities

Instruction in the animal science disciplines is enhanced through practical application at the various farm laboratory units. The Beef, Dairy, Horse, Meats, Sheep and Swine Units are maintained to support this educational purpose. In addition, veterinary and physiology laboratories are utilized to complement on-campus education. A 4,300-acre livestock and range management facility and another 800 acres of rangeland in the Sierra foothills are available.

Career Opportunities

Students specializing in animal science prepare for careers in the livestock industry where they may be engaged in consultation, management, production, research, teaching or other professional services as well as careers in business, government and foreign service. Students specializing in agricultural education may pursue a variety of challenging careers in the educational field.

The courses offered in the programs listed below provide the necessary background to prepare students for a career in the agricultural industry.

Agricultural Communications. Combines courses in agriculture with a journalism core and a specialty in advertising, news-editorial, photo communications, public relations or radio-television designed to train students for employment opportunities in the field of communication.

Basic Animal Science. Provides a science oriented curriculum in the disciplines of animal science. Prepares students for postbaccalaureate study or careers related to science, research and the technical aspects of animal science.

Dairy Science. Prepares students for commercial and registered dairy herd management, breed association representatives, artificial breeding services, dairy sanitation, milk quality control and other dairy-related occupations.

Meat Technology. Prepares students for employment in the meat industry by offering courses in the areas of meat science, muscle biology, food science and nutrition, food chemistry, and marketing.

Preveterinary Medicine. Provides a structured program of courses in animal science and related biological/physical sciences which prepares students for admission to schools of veterinary medicine and for employment in the animal health industry.

Production Management. Provides a curriculum designed to support a strong core of animal science with specialized training in agricultural business. Students who select this option may wish to consider a minor in agricultural business.

Teacher Preparation. Prepares students for positions as vocational agriculture teachers. (See Agricultural Education Major.)

Faculty

Scott A. Williamson, *Acting Chair*

Darren M. Nelson, *Graduate Coordinator*
Richard A. Rogers, *Agricultural Education Credentialing Coordinator*

David H. Bremel
John A. Jacobs
Darren M. Nelson
Arthur A. Parham
Anne V. Rodiek
Richard A. Rogers
Charles M. Smallwood
Michael W. Thomas
Scott A. Williamson

The faculty represent diverse specializations in the disciplines of animal science and teacher training. With doctoral degrees from many of the nation's outstanding agricultural universities, the faculty have combined philosophies of undergraduate education, research, curriculum development, industry relations and career placement into a unique program. Their experience combines the practical and theoretical aspects of the animal sciences to provide an education second to none. Students are assigned an adviser who assists in both academic and career planning on an individual basis. The faculty place a high priority on strong adviser-advisee relationships.

Bachelor of Science Degree Requirements
Animal Sciences Major

Options: Basic Animal Science, Dairy Science, Meat Technology, Preveterinary Medicine, Production Management.

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  - Category 3: Ag Ec 71 or Plant 99 (recommended)
- BREADTH
  - Division 1: Chem 1A or 3A (required)
  - Division 2: Biol 10 or Zool 1 or 10 (required)
  - Division 3: Plant 105 (recommended)
  - Division 4: FScN 53 (required)
  - Division 8: Ag Ec 1 (required)
- CAPSTONE
  - Agriculture and Government Policy Cluster (recommended): Ag Ec 150 and Phil 125 or Pl Si 150

Major (including 20 upper-division units) 45
- Animal Science Core ..... (33)
  - A Sci 1, 11, 35, 36, 65A, 101, 125, 135, 145A, 155, 156, 171A, 186
- Options (Select one) ..... (12)
  - *Basic Animal Science*
    - A Sci 180
    - Select one course from the following: A Sci 21, 31, 41, 51, 61
    - Select one course from the following: A Sci 146, 165, 166, 172
    - Select one course from the following: A Sci 121A, 131A, 151, 161
  - *Dairy Science*
    - A Sci 61, 161, 163, 181
  - *Meat Technology*
    - A Sci 165 or 194, 172, 181
    - Select one course from the following: A Sci 21, 31, 41
  - *Preveterinary Medicine*
    - A Sci 165, 166
    - Select two courses from the following: A Sci 21, 31, 41, 51, 61
  - *Production Management*
    - A Sci 181, 194 or 196
    - Select two courses from the following: A Sci 21, 31, 41, 51, 61
    - Select one course from the following: A Sci 121A, 131A, 151, 161

Additional requirements 16–29
- Upper-division writing skills
- *Basic Animal Science Option*
  - Micro 20; Chem 8, 109, 150; Ag Ec 76 or Plant 12
- *Dairy Science Option*
  - A Sci 146, 194; D Ind 103, or 143, 153; Ag Ec 76 or Plant 12; Ag Ec 110N or 117 or 120; Micro 20
- *Meat Technology Option*
  - Chem 3B; Micro 20; FScN 1, 110, 125, 141, 170; Ag Ec 76 or Plant 12
- *Preveterinary Medicine Option*
  - Chem 1B, 8, 109; Micro 20; Phys 2A; Zool 114, 160
- *Production Management Option*
  - Select 15 units from:
    - Ag Ec 28, 31, 76, 110N or 117 or 120, 130, 160

Electives (courses supplementary to major are strongly recommended) 3–16

Total minimum requirements (including 40 upper-division units) 128

Advising Notes:

1. New students should request an option check sheet from the department.
2. All students should make an appointment with their assigned faculty adviser prior to registration each semester.
3. *CR/NC* grading is not permitted for courses included in the major unless the courses have been designated *CR/NC* grading only.
4. The General Education units of 51 may be exceeded depending upon the selection of courses.
5. Upper-division units (i.e., 100 level courses) may not be applied toward the 40 upper-division unit degree requirement until 45 units have been completed.
6. Some General Education courses in CORE and BREADTH may be double counted to simultaneously satisfy Major as well as General Education requirements.
7. The upper-division writing skills requirement can be met by passing the university examination (UDWE) or by taking an approved upper-division writing skills course only after 56 units are completed. One unit of credit in Engl 100W may be earned for passing the exam if requested by the student; three to four units of credit will be earned by obtaining a letter grade of *C* or higher in an approved course.
8. One semester prior to graduation make an appointment with your faculty adviser to prepare an official Certification of Major Requirements form.
9. Preveterinary medicine students should consult their faculty adviser regarding entrance requirements and admissions procedures to the School of Veterinary Medicine, University of California, Davis. Total number of units will exceed 128 if a student chooses to meet all of the UC Davis School of Veterinary Medicine entrance requirements.

Bachelor of Science Degree Requirements
Agricultural Education Major

Options: Agricultural Communications, Teacher Preparation.

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  - Category 3: Ag Ec 71 or Plant 99 (recommended)
- BREADTH
  - Division 1: Chem 3A (required)
  - Division 2: Bot 10 or Zool 10 (required)
  - Division 3: Plant 105 (recommended)
  - Division 4: FScN 53 (recommended)
  - Division 6: Engl 20 (required)
  - Division 8: Ag Ec 1 (required)
- CAPSTONE
  - Agriculture and Government Policy Cluster (recommended): Ag Ec 150 and Phil 125 or Pl Si 150

Major (including 20 upper-division units) 54–57
- Select Teacher Preparation or Agricultural Communications
- Teacher Preparation Core ..... (36)
  - *Agricultural Economics* ..... (6)
    - Ag Ec 31, 110N or 120
  - *Animal Science* ..... (9)
    - A Sci 1, 11; Select one of the following: A Sci 21, 31, 41, 61
  - *Plant Science* ..... (12)
    - Cr Sc 1, OH 1, VTF 110, SI 100
  - *Agricultural Engineering Technology* ..... (9)
    - AET 1, 50, 114
- Teacher Preparation Career Specialty (select one) ..... (18)
  - Animal Science, Agricultural Engineering Technology or Plant Science (see Teacher Preparation Option check sheet)
- Agricultural Communications Core ..... (45)
  - *Agricultural Economics* ..... (6)
    - Ag Ec 153, 166
  - *Agricultural Education* ..... (3)
    - Ag Ed 150
  - *Journalism* ..... (9)
    - Jour 1, 8, 114
  - *Plant Science* ..... (12)
    - Cr Sc 1, OH 1, VTF 110, SI 100
  - *Agricultural Engineering Technology* ..... (3)
    - AET 2
  - *Enology, Food Science and Nutrition* ..... (3)
    - D Ind 23
  - *Animal Science* ..... (9)
    - A Sci 1, 11, 21 or 31 or 41 or 51 or 61
- **Agricultural Communications Career Speciality** (select one) ..... (12)
  - Advertising, News-Editorial, Photo Communications, Public Relations, Radio and Television (see Agricultural Communications Option check sheet)

Additional requirements 3–19
- Teacher Preparation
  - Upper-division writing skills
  - Teacher Education requirements:
    - Ag Ed 135, 150, 187, 189
    - T Ed 50
    - H S 121
- Agricultural Communications
  - Upper-division writing skills (Jour 100W required)

Electives 4–17
- Courses supplementary to the major are strongly recommended.

Total minimum requirements (including 40 upper-division units) 128

Advising Notes:

1. See advising notes 1–8 following Animal Sciences Major.
2. Teacher preparation majors seeking a Single Subject Teaching Credential are urged to take the Upper-Division Writing Examination (UDWE) at least once. Those who pass the examination may receive one unit of credit. (For details consult the Office of Testing Services.)
3. See the *Education — Teacher Education* section in this catalog for requirements related to the California Basic Educational Skills Test (CBEST).
4. Agriculture courses titled *Tours* or *Lectures* may be used to satisfy upper-division unit requirements but may not be counted to satisfy agricultural education core or specialized field requirements in the major.
5. Candidates for the Agriculture Specialist Credential must possess 3,000 hours or two years of occupational experience in agriculture. (For details, consult the agricultural education credentialing coordinator.)
6. Agricultural communications students must take and pass the language qualification examination. A screening examination administered by the Journalism Department must be passed before permission is given for enrollment in Jour 8 and in most of the other journalism writing and editing courses. (See prerequisites for each course before attempting to enroll.) Students who do not pass the Language Qualification Examination may retake it the following semester.

Single Subject Credential Waiver Program

Completion of the Bachelor of Science degree in Agricultural Education meets the requirements of the Single Subject waiver program. The Single Subject Credential authorizes the holder to teach *general agriculture* in grades 7–12. Students with a B.S. degree in another agricultural major may obtain a Single Subject Credential by completing the remaining coursework required for the B.S. degree in Agricultural Education.

Credential candidates must pass examinations in reading, writing and mathematics in addition to other numerous state of California and CSU, Fresno requirements. Consult the agricultural education major adviser and the department chair of teacher education for details; file an official *Program of Study.*

Agricultural Specialist Credential Program

The Agricultural Specialist Credential, which authorizes holders to teach secondary school vocational agriculture, is offered jointly by the School of Agricultural Sciences and Technology and the School of Education and Human Development. It requires completion of the Single Subject waiver program (see above), professional education courses (see *Department of Teacher Education — Single Subject Credential — Program Requirements, Professional Preparation*), and an approved fifth-year program of 30 postgraduate units including Ag Ed 135, 150, 187, 189; T Ed 155B, 161; and Agri 280, 281.

Minor

A minor in animal sciences consists of 21 units of which 9 must be upper-division. Courses in a major cannot be applied toward a minor unless designated as "additional requirements." Specific course requirements are Introductory Animal Science (A Sci 1), Livestock Selection and Evaluation (A Sci 11), Feeds and Feeding (A Sci 35) and Meat Science (A Sci 171A). Students must select 3–4 units from upper-division animal science courses (A Sci 101, 125, 135, 145A, 155, 156). Students must select 4–5 units from the following animal science courses (A Sci 65A, 121A, 131A, 151, 161, 181, 183, 196). The certified minor program is filed with the Office of Evaluations. A minor may be earned only at the time a student earns the first baccalaureate degree.

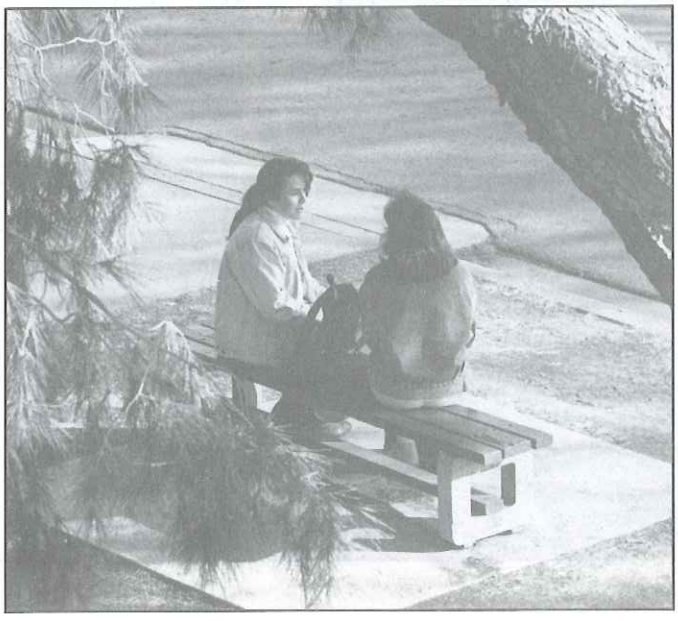
Master of Science Degree Program

The Master of Science degree in Agriculture with an option in animal science is a 30-unit program designed to extend professional competence in agricultural research, agricultural production, and agricultural teaching, and to provide the first graduate degree for students anticipating advanced graduate work in the agricultural sciences. Coursework in animal science includes animal nutrition, meats, physiology, breeding and genetics, management, and health. Full-time graduate students may earn the degree within two years when working closely with an adviser. To accommodate part-time students, graduate courses are offered in the late afternoon or evening.

Admission Requirements

The Master of Science degree in Agriculture with an option in animal science assumes preparation equivalent to a Bachelor of Science degree in Agriculture with an animal science major. Students who have not completed a Bachelor of Science degree in Agriculture (animal science major) are expected to have completed the following courses or their equivalents prior to enrollment in courses to be applied to the master's program: Chem 1A or 3A, Chem 8, Zool 10, A Sci 35, 125, 135, 145A, 155, 165 or 166, and two animal science production-type courses.

Admission by the university does not imply acceptance in the Master of Science in Agriculture program. Separate application must be made to the School of Agricultural Sciences and Technology.



Applicants whose preparatory education was principally in a language other than English must earn a minimum TOEFL score of 550.

Applicants to the master's program are required to possess a Bachelor of Science degree in Agriculture (animal science major) from an accredited institution, achieve a 450V/430Q GRE score or 880 combined score, have a 2.75 GPA on the last 60 semester units, make separate application to the School of Agricultural Sciences and Technology, and submit a statement of 500 words or less, and three letters of reference.

Prerequisite Requirements

Plant 99 or Math 101 is required.

Program Requirements

The student, under the direction of a graduate adviser, prepares and submits a coherent program individually designed within the following framework:

	Units
Core:	
Agri 200, 201, 220	9
Required Courses:	
Agri 260 (1+1); and select 12 units from the following: Agri 241, 242, 243, 244, 245, 246, 247, 248, 240T	14
Electives:	
Chem 150 or approved 100-200 level course	3
Culminating Experience:	
Agri 299	4
Total minimum requirements	30

Graduate Advising Notes:

1. Several of the 200-level and approved elective courses have prerequisites other than courses listed as admission requirements.
2. Students must request specific information concerning the Master of Science program from the department office.
3. Upon admission, students should see the graduate coordinator for aid in program planning, selection of graduate adviser and selection of a thesis committee.
4. To progress through the graduate program, the student must
   a. Maintain a minimum 3.0 GPA.
   b. Complete all prerequisite coursework.
   c. Attain classified standing.
   d. Meet university writing requirement.
   e. File for advancement to candidacy.
   f. Pass the departmental qualifying examination.
   g. Complete the program requirements.
   h. File a master thesis committee assignment form.
   i. Formally present and defend the thesis research results.
5. Advancement to candidacy requires the completion of 9 program units in residence (minimum GPA of 3.0), meeting the university writing skills requirement, departmental requirements and filing a petition for advancement to candidacy a minimum of one semester prior to enrollment in thesis and within the deadline.
6. The student shall meet the university writing requirement by earning a minimum of 450 verbal on the GRE. If a minimum of 450 verbal is not met by a student, the student shall meet the requirement by then earning a score of 80 or higher in the writing competency examination or by earning a *B* or better in a designated W course to be specified by the graduate committee of the School of Agricultural Sciences and Technology.
7. The student may apply a maximum of two units of independent study to the master's program.
8. See *Division of Graduate Studies and Research* in this catalog for university requirements.

COURSES

Note: Active immunization against tetanus (available through Student Health Services) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the University Farm.

Note: Cost to the student of extended field trips varies each semester depending upon itinerary. Student should ask the course instructor.

Animal Science Principles (A Sci)

1. Introduction to Animal Science (3). Overview of the livestock and poultry industry; types and breeds, world distributions, foods and products from farm animals, reproduction, genetics, nutrition, and marketing. (2 lecture, 3 lab hours) (Former A Sci 10 and 10L)

35. Feeds and Feeding (3). Prerequisite: Chem 3A. Recommended concurrent enrollment in A Sci 36. Principles of nutrition; nutrients and their metabolism; comparison of qualitative nutrient requirements of non-ruminant and ruminant animals and formulating diets to meet these requirements. (Former A Sci 70)

36. Feeds and Feeding Lab (1). Prerequisite: A Sci 35 (or concurrently). Laboratory principles involved with nutrition, digestion and diet formulation. (3 lab hours)

65A. Introduction to Animal Health (3). The stockman's approach to animal health and disease control in domestic animals. Classification of animal diseases, their causes and appropriate treatments with emphasis on preventative medicine. (2 lecture, 3 lab hours) (Former A Sci 120 and 120L)

101. Environmental Management of Farm Animals (3). Prerequisite: A Sci 1. Basic principles of environmental management as applied to domestic farm animals. Special emphasis given to animal behavior, animal welfare and animal performance. The optimal animal environment will be studied in detail.



National coverage was just a "Red Wave" away when members of CSUF's Dairy Club gave a hearty "Good Morning" to America.

125. Principles of Animal Breeding (3). Prerequisite: A Sci 1. Genetic principles and application to livestock production; basic inheritance, qualitative genetics, variation in economic traits of livestock, quantitative inheritance, selection progress; current methods of genetic livestock improvement.

135. Animal Nutrition (3). Prerequisite: A Sci 35. Principles of nutrition and metabolism; digestive physiology of farm animals. (Former A Sci 170)

145A. Anatomy and Physiology of Farm Animals (3). Prerequisite: Biol 10 or Zool 1 or 10. General structures of farm animals and physiological functions of organs in the animal body. (Former A Sci 110)

146. Physiology of Lactation (3). Fundamentals of anatomy, physiology and endocrinology of milk synthesis and secretion; milking machine systems and management; pathological and environmental factors affecting lactation. (Former A Sci 142)

155. Animal Reproduction (3). Prerequisite: A Sci 145A. Principles of reproductive physiology, associated endocrine hormones and their application to domestic animals.

156. Artificial Insemination — Embryo Transfer (1). Prerequisite: A Sci 145A, 155 (or concurrently). Basic principles of artificial insemination and embryo transfer with emphasis on application to cattle. (3 lab hours) (Former A Sci 152)

163. Dairy Cattle Nutrition (3). Prerequisite: A Sci 135. Principles of dairy cattle nutrition. Nutritional requirements of the dairy calf through the mature cow. Special emphasis on computerized diet formulation and feed inventory control. (Former A Sci 185T section)

165. Infectious Diseases of Domestic Animals (4). Prerequisite: Biol 10 or Zool 1 or 10. Microbiological concepts related to bacterial, viral, and fungal diseases in domestic animals with emphasis on specific diseases of veterinary importance. (3 lecture, 3 lab hours) (Former A Sci 65)

166. Parasitology (4). Prerequisite: college zoology. A study of the general biology of symbiotic organisms of animals and man; including life cycles, infection and disease processes, physiology and treatment. Laboratory emphasis of biological processes, parasite identification and diagnosis. (3 lecture, 3 lab hours) (Former A Sci 136)

Production and Management (A Sci)

11. Livestock Selection and Evaluation (3). Prerequisite: A Sci 1 (or concurrently). Basic factors involved in selection and evaluation of livestock; relationships of live market animal traits to carcass cutability and quality. (2 lecture, 3 lab hours)

21. Beef Cattle Production (3). Prerequisite: A Sci 1 (or concurrently). Overview of world and United States beef production. Evaluation of the structure of the beef industry (consumer, packer, retailer, feedlot, seedstock, commercial cow-calf, stocker). Discussion of genetics, nutrition, reproduction, and meat science as applied to beef cattle. (2 lecture, 3 lab hours)

31. Swine Production (3). Prerequisite: A Sci 1 (or concurrently). Management principles and practices of purebred and commercial pork production. Nutrition, reproduction, environmental management, health, marketing, selection and records are studied. (2 lecture, 3 lab hours; field trips)

41. Sheep Production (3). Prerequisite: A Sci 1 (or concurrently). Management of purebred, commercial, and small farm flocks; principles and practices in breeding, feeding, care of ewes and lambs, and marketing of lamb and wool. (2 lecture, 3 lab hours)

51. Horse Production (3). Prerequisite: A Sci 1 (or concurrently). Not open to students with credit in A Sci 152A. Breeds, selection, care, and feeding of light horses. (2 lecture, 3 lab hours)

61. Dairy Cattle Production (3). Prerequisite: A Sci 1 (or concurrently). Principles and practices of milking, feeding, breeding, evaluating, housing, health, behavior, and management of dairy cattle. (2 lecture, 3 lab hours) (Former A Sci 12 and 12L)

71. Meats and the Consumer (3). Consumer problems in buying meat to include quality and price selection, identification, nutritive value; storage, processing, preparation for consumption; and government inspection and standards. (2 lecture, 2 lab hours) (Former A Sci 131)

81. Introduction to Livestock and Dairy Evaluation (3). Introductory course in evaluating livestock for breeding and market purposes. Utilizes visual and performance data in establishing the economic value of animals representing the beef, sheep, swine, dairy and horse industries. (2 lecture, 3 lab hours) (Former A Sci 185T section)

121A. Advanced Beef Management (4). Prerequisite: A Sci 21. Prevailing and alternative management systems and techniques of beef production in the United States and California including economic analysis. (3 lecture, 3 lab hours) (Former A Sci 111 and 111L)

131A. Advanced Swine Management (4). Prerequisite: A Sci 31. A comprehensive study of the swine industry. Laboratory exercises designed to improve the management decision ability of students. (3 lecture, 3 lab hours; field trips) (Former A Sci 160T section)

151. Advanced Horse Management (3). Prerequisite: A Sci 51. Advanced principles of horse management, reproduction, breeding systems, nutrition, facilities, business aspects, exercise physiology, training colts. (2 lecture, 3 lab hours)

152A. Practical Horsemanship (3). Intended for students who desire a general knowledge of the modern light horse industry; evaluation and selection, horsemanship principles, training techniques, diseases and unsoundness, nutrition, breeding, buildings and equipment. (Former A Sci 145)

161. Advanced Dairy Farm Management (4). Prerequisite: A Sci 61. Planning the development and operation of a complete modern dairy production unit, including all costs and managerial responsibilities required for a successful operation. (3 lecture, 2 lab hours; field trips) (Former A Sci 112)

171A. Meat Science (3). Prerequisite: A Sci 1 (or concurrently). Basic meats course; inspection, factors that affect quality and quantity of meat; selection and preparation of meats and meat products. Two lab sections offered: Lab A includes slaughtering and processing; Lab B is consumer oriented processing without slaughtering. (2 lecture, 3 lab hours) (Former A Sci 121)

172. Meat Technology (3). Prerequisite: A Sci 171A. Fabricating and pricing of wholesale and retail meats; technology of fresh and processed meat; sausage manufacturing; quality control. (2 lecture, 3 lab hours) (Former A Sci 123)

Special Topics and Industry Relations (A Sci)

180. Undergraduate Research (1–4; max total 4). Open to juniors and seniors. Exploratory work on a suitable agricultural problem in animal science. Approved for *SP* grading.

181. Advanced Livestock and Dairy Evaluation (3; max total 6). Prerequisite: A Sci 11 or 81, or permission of instructor. Detailed analysis of animal form related to functional efficiency, economic value, and sound livestock production management. Written and oral defense of judgments (dairy, horse, livestock, meats). (2 lecture, 3 lab hours; field trips) (Former A Sci 101)

182. Fitting and Showing Livestock (1–2; max total 4). Development of skills in the fitting and showing of beef, sheep, swine, dairy, and horse animals; discussion, demonstration, and participation in the application of basic skills. Students may elect one or more species. (2 lab hours per unit) (Former A Sci 105)

183. Animal Science Tour (2; max total 4). A field study tour of animal science enterprises including ranches, processing plants and facilities at other universities. Approved for *SP* grading. (Field trip fee, $70 to $75) (Former A Sci 175)

184. Animal Science Lectures (1; max total 4). A series of lectures by prominent, successful animal scientists and agribusiness executives presenting current developments in their field. (Former A Sci 177)

185T. Topics in Animal Science (1–4; max total 4 per discipline if no topic repeated). Prerequisite: junior standing, permission of instructor. Anatomy, physiology, pathology, nutrition, genetics, livestock management. Topics may require labs. (Former A Sci 160T section)

186. Animal Science Seminar (1). Open to seniors majoring in animal science. Latest developments in research; assigned papers in animal science to be presented in both oral and written form. (Former A Sci 150)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

194. Agricultural Internship (1–8; max total 8). Prerequisite: junior or senior standing and approval of internship committee. Emphasis on development of decision-making ability through industrial experience integrated with basic principles acquired in the classroom. *CR/NC* grading only.

196. Enterprise Management (1; max total 6). Prerequisite: AET 3; A Sci 21, 31, or 41; or permission of instructor; concurrent participation in project program required. Theory and field application of management principles in beef, sheep, swine, and other appropriate animal science enterprises.

Agricultural Education (Ag Ed)

80. Undergraduate Research (1–4; max total 4). Open to freshmen and sophomores with permission of instructor. Exploratory work on a suitable agricultural problem in agricultural education. Approved for *SP* grading.

115. FFA Activities (2; max total 4). Organization and administration of various FFA activities. Parliamentary procedure and meeting organization; committee work and structure. (Former Ag Ed 160T section)

135. Introduction to Agricultural Education (3). Survey of agricultural education in California, including qualifications for teaching agriculture, structure and content of vocational agriculture programs. Supervision of vocational youth organizations.

150. Agricultural Resources and Computer Applications (3). Prerequisite: junior standing. Development and application of techniques for obtaining and using resource materials including government documents, university and experiment station reports. Development of basic computer skills utilized in agricultural education. (2 lecture, 2 lab hours)

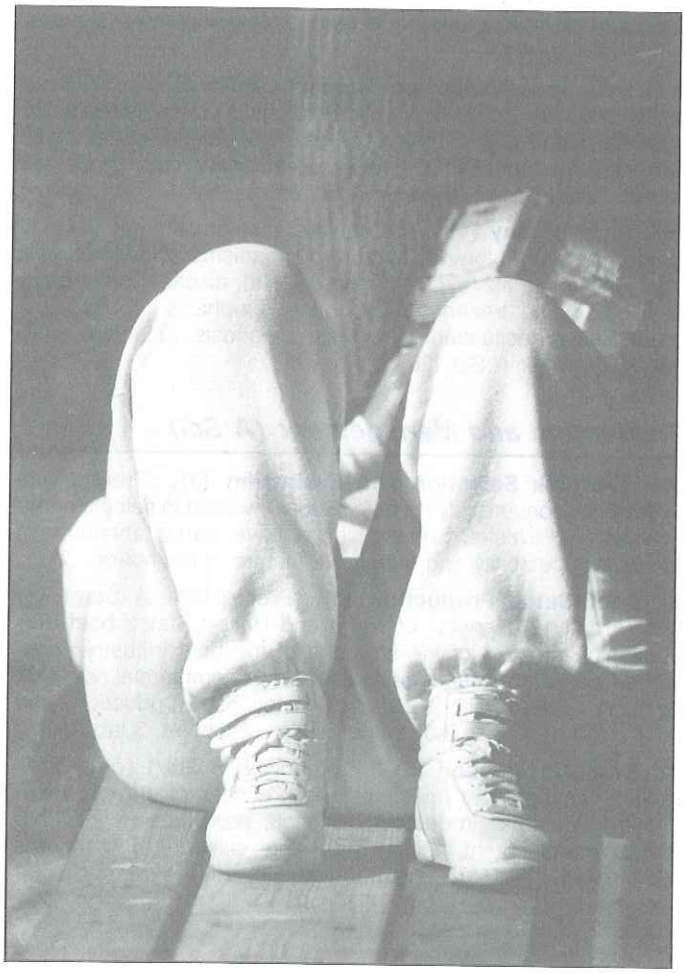
160T. Topics in Agriculture (1–4; max total 6 per discipline if no topic repeated). Prerequisite: junior standing, permission of instructor. Agricultural education. Topics may require lab hours.

180. Undergraduate Research (1–4; max total 4). Open to juniors or seniors with permission of instructor. Exploratory work on a suitable agricultural problem in agricultural education. Approved for *SP* grading.

187. Organization, Administration, and Supervision of Agricultural Education (3). Prerequisite: senior standing. A study of the California and federal plans for vocational education as they pertain to agricultural education.

189. Education in Agricultural Mechanics (3). Prerequisite: junior standing. Strategies for organizing, teaching and administering educational programs in agricultural mechanics for youth and adults.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.



GRADUATE COURSES

The following courses are open to students who have been accepted into the graduate program. Students who are not in graduate standing should contact the department graduate coordinator prior to enrolling.

Agriculture (Agri)

200. Biometrics in Agriculture (3). Prerequisite: Math 101 or Plant 99, permission of instructor. Advanced concepts in the design of agricultural experiments. Emphasis is placed on the selection of appropriate designs to meet the objectives of well-planned experiments. Relative merits of various designs and topics in analysis, interpretation, and regression are covered.

201. Agricultural Laboratory Techniques (3). Prerequisite: One of the following courses: Bot 104; Chem 105, 109, 151; Enol 115 or FScN 130. Agricultural problem solving through the application of advances in laboratory technology, crop management, foods, nutrition, soil and water quality. Theory and practice operation of scientific instruments and techniques are taught. Student-defined project and report required. (2 lecture, 3 lab hours) (Former Agri 250T section)

220. Research Communications in Agriculture (3). Prerequisite: completion of university writing skills requirement. Emphasis on critical literature review, scientific writing, and oral presentation of research results. Approved for *SP* grading.

240T. Topics in Animal Science (3; max total 12). Prerequisite: upper-division animal science appropriate to study topic; permission of instructor. Investigation of topic in animal science; anatomy, physiology, pathology, nutrition, genetics, or economics. Topics may require lab hours.

241. Endocrine and Reproductive Physiology (3). Prerequisite: A Sci 155. Physiology which deals with neural and hormonal integration and control of the animal body, including scientific aspects of the processes of reproduction and application of current knowledge in improving reproductive efficiency.

242. Environmental Physiology of Domestic Animals (3). Prerequisite: A Sci 145A; permission of instructor. A study of environmental factors affecting domestic animals under field and controlled conditions.

243. Metabolism and Energy Physiology (3). Prerequisite: Chem 8. Current aspects of the integral processes involved in metabolism and energy physiology of laboratory and farm animals. Application of the principles concerned in intermediary metabolism. Selected readings in the current literature within the field.

244. Vitamin and Mineral Nutrition (3). Prerequisite: A Sci 135. A survey of the biochemical and physiological importance of vitamins and minerals in the nutrition of man and his animals. Included is the diagnosis, prevention, and treatment of both vitamin and mineral deficiencies.

245. Advanced Animal Breeding (3). Prerequisite: A Sci 125, 155; permission of instructor. The application of genetic principles to the breeding of livestock. The study of applied selection and measurements of the results.

246. Ruminant Nutrition (3). Prerequisite: A Sci 135, Chem 150. Ruminant physiology of digestion, absorption, and metabolism and nutrients, and the relationship of enzymes and hormones. (Former Agri 240T section)

One of my college professors was very influential. He encouraged me by telling me that there were career opportunities with horses and that I should do the things I like instead of the things I'm supposed to do.

Anne Rodiek
Professor, Animal Sciences

247. Concepts in Non-Ruminant Nutrition (3). Prerequisite: A Sci 135 or equivalent, graduate standing or consent of instructor. Digestion, absorption, nutrient utilization, and interrelationships in poultry, swine, and other non-ruminants. (Former Agri 240T section)

248. Meat Science and Muscle Biology (3). Prerequisite: A Sci 171A, graduate standing or consent of instructor. Evaluation of muscle as meat; biological characteristics, growth and development of skeletal muscle, glycogen metabolism, and factors affecting quality of meat. (Former Agri 240T section)

260. Seminar in Animal Science (1; max total 2). Prerequisite: permission of instructor. Written and oral reports on selected areas of research on problems in animal science.

280. Seminar in Agricultural Education (1–3; max see below). Maximum total credit 9 units in any given area or any combination of the three areas. Prerequisite: permission of instructor; admission to teacher preparation program; bachelor's degree in agriculture. Advanced problems in agriculture; research and experimentation in a selected area; animal science, plant science, or agricultural mechanics. Approved for *SP* grading.

281. Problems in Agricultural Education (1–3; max total 3). Prerequisite: graduate standing. Individual supervised research in agricultural education; appropriate reports and evaluation required. Individual conferences.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

299. Thesis (2–4; max total 4). Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE *(Agri)*

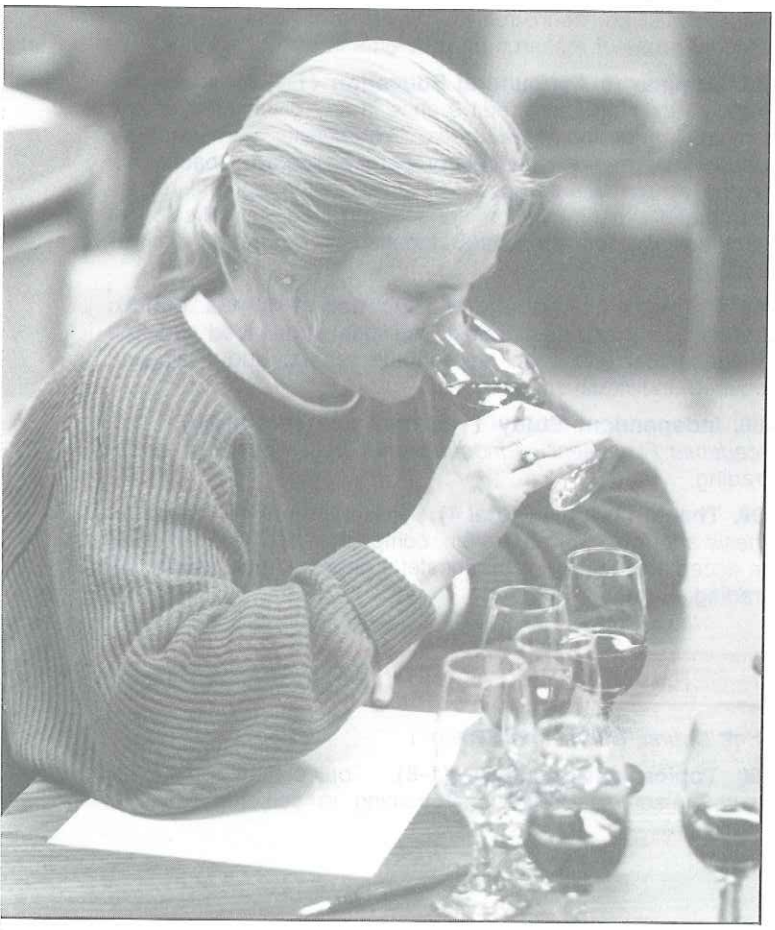
(See *Course Numbering System*.)

300. Topics in Agriculture (1–3). Topics may require lab hours. In-service professional training in selected areas of agriculture.

AGRICULTURE
Enology, Food Science and Nutrition

School of Agricultural Sciences and Technology
Department of Enology, Food Science and Nutrition
N. Joanne Caid, Chair
Art Home Economics Building, Room 103
(209) 278-2164

B.S. in Food and Nutritional Sciences
Options: Dietetics and Food Administration
Enology
Food Science
Food Systems Management
Sports Nutrition
Minor in Food and Nutritional Sciences
M.S. in Agriculture
Options: Food Science and Nutrition
Agricultural Chemistry



Students majoring within the Department of Enology, Food Science and Nutrition are prepared for a wide range of professions in the food industry — the largest single industry in the United States. CSU, Fresno is centered in the greatest food production and processing area in the world. Some of the largest and best wine, dairy and food companies cooperate with CSU, Fresno to provide students with a view of commercial realities in this industry. There is strong demand for dietitians and nutritionists by the health care and food-service industries. Courses in many other areas — such as chemistry, biochemistry, microbiology, business and agricultural economics — may be used as electives to achieve individual professional goals.

Instructional Facilities

The department facilities include the Enology Facility, Dairy Processing Plant, Food Preparation and Product Development Laboratories, and Computer Laboratory. These facilities are used by students and faculty to provide a practical education founded on science and technology.

Career Opportunities

Graduates of the Department of Enology, Food Science and Nutrition have enjoyed outstanding employment opportunities in the food industry. Historically, graduates have been placed in challenging positions with salary advancement and professional prestige envied by other industries throughout the free world. The following options are available:

Dietetics and Food Administration. Graduates are prepared for challenging and rewarding employment in dietetics, nutrition and foodservice. Employment is always available in hospital dietetics, nutrition consulting, school and community nutrition, education, commercial and institutional foodservices. By completing the requirements for this option, students meet the American Dietetics Association Plan V requirements. Completion of an internship or approved program of study and registration exam is required to become a registered dietitian.

Enology. California is recognized, both nationally and internationally, as the foremost leader in enology. CSU, Fresno is one of only two universities in the United States that offers a full program of study in enology. Enology graduates have taken employment leading to top positions with prestigious wineries that are recognized as the finest in California and in the world.

Food Science. Graduates are prepared for an endless variety of employment opportunities in the food industry, including laboratory, food processing and production, and governmental roles. New product development, management, distribution, and field service opportunities are present in many scientific, technological and business endeavors.

Food Systems Management. Graduates are employed by food preparation and foodservice industries. The intense public interest in all aspects of nutrition provides employment, challenge and reward to food systems management graduates.

Sports Nutrition. Graduates are employed in fitness centers, wellness programs and as consultants for sports programs. This innovative program reflects the increased awareness of the relation between nutrition and exercise.

Faculty

N. Joanne Caid, *Chair*

Barry H. Gump, *Graduate Coordinator, Food Science and Nutrition*
Barry H. Gump, *Graduate Coordinator, Agricultural Chemistry*
N. Joanne Caid, *Coordinator, Nutrition and Dietetics*
Carlos J. Muller, *Director, Enology Program*

Shirley J. Bowden
N. Joanne Caid
Dean R. Frazeur
David E. Goldbloom
Elena F. Kissick
Carlos J. Muller
Fred S. Nury

The faculty continue to be recognized for quality hands-on education as well as scholarly contributions to their academic disciplines. Each student is assigned to a faculty adviser to maximize the educational experience at CSU, Fresno. The faculty are noted for cooperation and activity within each industry to prepare and place graduates in their chosen career.

Bachelor of Science Degree Requirements
Food and Nutritional Sciences Major

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  1. Engl 1 (required)
  2. Spch 3 (required)
  3. H S 92 (required for Dietetics and Food Administration and Sports Nutrition Options only)
  4. Upon selection with adviser
  5. Hist 11 or 12 (required)
  6. P1 Si 2 or 101 (required)
- BREADTH
  - Division 1: Chem 3A (required)
  - Division 2: Biol 10 or Bot 10 (required)
  - Division 3: Psych 10 (required for Dietetics and Food Administration and Sports Nutrition Options only)
  - Division 4: FScN 53 (required for Food Systems Management Option)
    P E 31 (required for Sports Nutrition Option only)
  - Division 5: Upon selection with adviser
  - Division 6: Upon selection with adviser
  - Division 7: Upon selection with adviser
  - Division 8: Soc 1 (required for Dietetics and Food Administration and Sports Nutrition Options only)
    Econ 40 (required for Food Systems Management Option)
  - Division 9: Upon selection with adviser
- CAPSTONE
  - Upon selection with adviser

Major (including 20 upper-division units) 45
- Core ..... (9)
  - FScN 1, 50 and 54
- Options (select one) ..... (36)
  - Dietetics and Food Administration: FScN 131, 132, 133, 134, 149, 150, 153, 157A, 157B, 166; Psych 174; plus additional course in consultation with adviser.
  - Enology: Enol 15, 25, 35, 100, 101, 135, 165, 175, 178; career specialty core (select one)
    - Wine Production
      Enol 110, 115, 125, 185
    - Wine Marketing
      Ag Ec 124, 160; Enol 104, 105, 173; plus additional course in consultation with adviser.
    - Wine Quality Assurance
      Enol 110, 115, 125
  - Food Science: A Sci 171; D Ind 23, 103, 113; FScN 100, 110, 125, 130, 141, 142, 150, 170
  - Food Systems Management: FScN 131, 132, 133, 134, 135, 150, 160, 169, 193; Enol 25, 173; A Sci 171A; plus additional courses in consultation with adviser
  - Sports Nutrition: FScN 48, 147, 149, 157A, 162T, 166; plus FScN courses selected in consultation with adviser; Psych 174; Phy 64, 65

Additional requirements 21–29
- Dietetics and Food Administration ..... (27–29)
  - Upper-division writing skills; Chem 8, 109, 150, 153; Micro 20; Phy 64, 65; Acct 4A
- Enology ..... (25–27)
  - Upper-division writing skills; Chem 8; VTF 104; Jour 113; plus career specialty (select one)
    - Wine Production
      Chem 105, 150; AET 109; Micro 104
    - Wine Marketing
      Ag Ec 31, 120, 130, 164; Spch 170
    - Wine Quality Assurance
      Chem 109, 125, 150; Micro 104; plus additional course in consultation with your adviser
- Food Science ..... (24–26)
  - Upper-division writing skills; Chem 4, 8, 105, 150; AET 109; Micro 20; Phys 2A
- Food Systems Management ..... (25)
  - Acct 4A; Econ 50; Mgt 110; Mktg 100; HRM 150, 152; IS 105W
- Sports Nutrition ..... (21–23)
  - Upper-division writing skills; Chem 8, 109, 150, 153; P E 115K, 156A, 156B

Electives 3–11

Total requirements (including 40 upper-division units) 128

Advising Notes:

1. New students should request an options check sheet from the department.
2. All students should make an appointment with an academic adviser prior to registration each semester.
3. *CR/NC* grading is not permitted for courses included in the major. Work experience units for FScN 193, which is graded on a *CR/NC* basis, is the only exception.
4. Upper-division units (i.e., 100-level courses) may not apply toward the 40 upper-division unit degree requirement until 45 units have been completed.
5. The food and nutrition core should be completed no later than the end of the first semester of the junior year.
6. The career specialty in the major consists of 15 units of approved courses under either a formally recognized emphasis area (see department options check sheet) or an individually tailored emphasis area of logically integrated courses to meet the student's particular career objective.
7. General Education courses designated as required by the department are prerequisite to many courses in the program of study.

8. The upper-division writing skills requirement can be met by passing the university upper-division writing examination or by taking an approved upper-division writing skills course. One unit of credit (in English 100W) may be earned for passing the examination if requested by the student; by obtaining a letter grade of *C* or higher in an approved course (e.g., Plant 110W) the student meets the university writing skills requirement.
9. One semester prior to graduation make an appointment with your academic adviser to prepare and file an official Certification of Major requirement form.
10. The General Education units of 51 may be exceeded depending upon the selection of courses.

Minor

A minor in food and nutritional sciences consists of 21 units of which 9 must be upper division. All students must take FScN 1, 50 and 54. The additional 12 units will be selected in consultation with an adviser. The minor program must be certified by the appropriate department chair and the school dean. The certified minor program will be filed with the Office of Evaluations.

Master of Science Program

Master of Science in Agriculture — Option in Food Science and Nutrition

The Master of Science degree in Agriculture with an option in food science and nutrition is a 30-unit program designed to provide the student with professional competence in the technology and science of food related disciplines.

This program provides a graduate level proficiency in the food sciences, dietetics and nutrition. This degree is applicable to food related specializations in food research, production, chemistry, microbiology, dairy industry, nutrition, dietetics and food administration, and other food sciences and technology. Full-time graduate students may earn the degree within two years when working closely with an adviser. To accommodate part-time students, graduate courses are offered in the late afternoon or evenings.

Admission Criteria

The Master of Science degree in Agriculture with an option in food science and nutrition assumes preparation equivalent to a baccalaureate degree in biochemistry, chemistry, dairy industry, dietetics or nutrition, food science, or related fields from an accredited institution, a 3.0 GPA (last 60 semester units); and a minimum GRE score of 450 verbal and 430 quantitative or a total score of 880. Admission by the university does not imply acceptance in the Master of Science in Agriculture degree program. Applicants whose preparatory education was principally in a language other than English must earn a minimum TOEFL score of 550.

Full classified standing requires a baccalaureate degree in one of the areas listed above; a 3.0 GPA (last 60 semester units); and either a 450V/430Q GRE score or 880 combined score; completion of all prerequisite coursework; separate school application; three letters of reference from employers or faculty at the university attended most recently; and a statement of 500 words or less indicating reasons for pursuing a master's degree.

Conditional classified standing may be granted to petitioning applicants with a 2.75 to 2.99 GPA (last 60 semester units); GRE scores on file in the university Testing Office; separate school application; three letters of reference, and a statement of 500 words or less. Prerequisite coursework is not included in the 30-unit master's program. Students must request full classified status in the program by the semester in which a minimum of 10 units to be used toward the degree are completed.

Prerequisite Courses

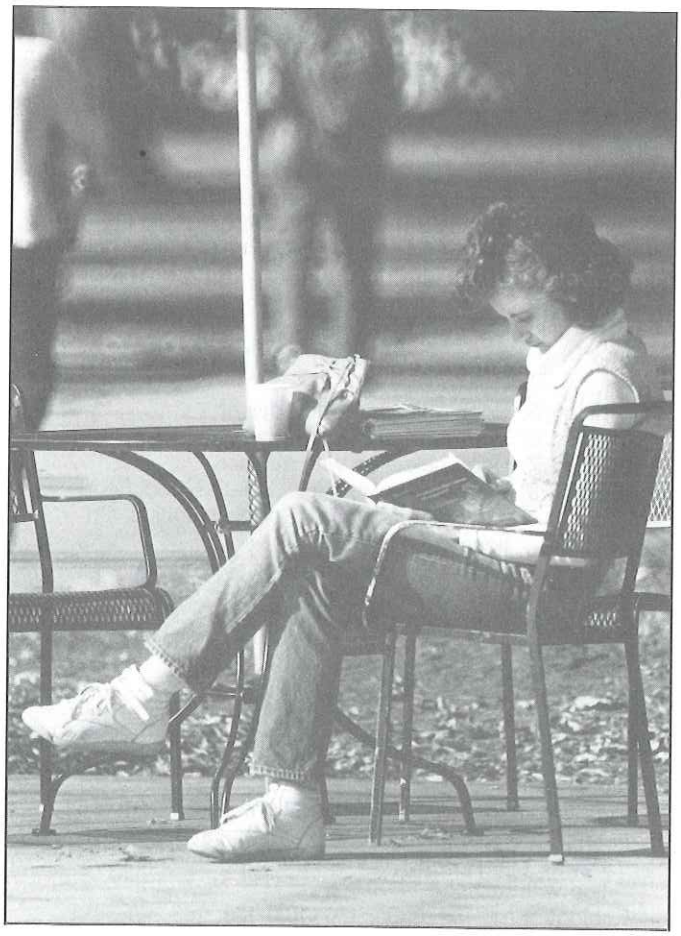
The Master of Science degree in Agriculture with an option in food science and nutrition assumes preparation equivalent to a CSU, Fresno undergraduate major in dairy industry, food science, dietetics or nutrition, or related fields.

Students having undergraduate degrees in other fields or from other institutions who need to make up course deficiencies should consult with the graduate coordinator. The following specific prerequisite foundation courses, or their equivalents, are 'to be completed in addition to the 30-unit master's degree coursework and prior to entering the graduate program.

Chem 150, Micro 104, Plant 99 or Math 101, FScN 100, 110, 125 or D Ind 153, FScN 130, 141, 170; or Chem 150, 151, Plant 99 or Math 101, Phy 33, FScN 150, 153, 157A, 157B, for food science and dietetics or nutrition career specialties respectively.

Program Requirements — Food Science and Nutrition Option

All students must complete a 9-unit common core. Under the direction of the graduate adviser, students may focus their program in a specialized area to meet their career goals. This is accomplished by the selection of required courses, electives and thesis (Plan A only). A 3-unit thesis or a comprehensive exam completes the program of study.



Plan A

	Units
Core: Agri 200, 201, 220	9
Required Courses:	
Agri 229	1+1
Select Four: Agri 203, 204, 205, 209, 222, 223, 224, 226	12
Approved Electives: appropriate to individually designed program (200 or 100 level courses in agricultural science or related areas)	4
Culminating Experience: Plan A — Agri 299 (Thesis and defense)	3
Total minimum requirements	30

Specific Requirements — Food Science and Nutrition Option

Plan C

	Units
Core: Agri 200, 201, 220	9
Required Courses:	
Agri 229	1+1
Agri 290	3
Select three: Agri 203, 204, 205, 209, 222, 223, 224, 226	9
Approved Electives: appropriate to individually designed program (200 or 100 level courses in agricultural science or related areas)	7
Culminating Experience: Comprehensive Examination	0
Total minimum requirements	30

See graduate advising notes following the M.S. in Agriculture — Agricultural Chemistry Option.

Master of Science in Agriculture — Option in Agricultural Chemistry

The Master of Science in Agriculture with an option in agricultural chemistry is designed to provide the student with advanced training and professional competence in the science of chemistry as it applies to agriculture. This degree permits the student and adviser to design an individual program in various specializations in the application of chemical and biochemical systems in agricultural industries.

Enologists seeking the master's degree are required to do so under this option.

Admission Criteria

The Master of Science degree in Agriculture with an option in agricultural chemistry assumes preparation equivalent to a baccalaureate degree in agricultural science option II, or related fields from an accredited institution, a 3.0 GPA (last 60 semester units); and a minimum GRE score of 450 verbal and 430 quantitative or a total score of 880. Admission by the university does not imply acceptance in the Master of Science in Agriculture degree program. Applicants whose preparatory education was principally in a language other than English must earn a minimum TOEFL score of 550.

Full classified standing requires a baccalaureate degree in the areas listed above; a 3.0 GPA (last 60 semester units); and either a 450V/430Q GRE score or 880 combined score; completion of all prerequisite coursework; separate school application; three letters of reference from employers or faculty at the university attended most recently; and a statement of 500 words or less indicating reasons for pursuing a master's degree.

Conditional classified standing may be granted to petitioning applicants with a 2.75 to 2.99 GPA (last 60 semester units); GRE scores on file with the university Testing Office; separate school application; three letters of reference; and a statement of 500 words or less. Prerequisite coursework is not included in the 30-unit master's program. Students must request full classified status in the program by the semester in which a minimum of 10 units to be used toward the degree are completed.

Prerequisite Courses

The Master of Science degree in Agriculture with an option in agricultural chemistry is essentially a change of major for most students. Therefore, applicants to the agricultural chemistry option are expected to have completed the following prerequisite foundation courses prior to entering the graduate program.

I. Undergraduate Core Courses	Units
Micro 104 Microbiology	5
Bot 104 Plant Physiology	4
Chem 105 Quant Analysis	4
Chem 128B Organic Chemistry	3
Chem 129B Organic Chemistry Lab	2
Chem 125 Lab Instrument	3
Math 70 Calculus	4
Phys 2A–B General Physics	4–4
Plant 99 App Agri Statistics	3
I T 102 or a course in computer literacy	3
II. Agricultural Science Core — Undergraduate (SAST requirements)	12
III. Additional requirements specified by department	

Program Requirements — Agricultural Chemistry Option

All students must complete a 9-unit common core. Under the direction of the graduate adviser, students may focus their program in a specialized area to meet their career goals. This is accomplished by the selection of 12 units of approved electives of which a maximum of 6 units can be 100 series (if not applied toward undergraduate degree requirements). A 4-unit thesis completes the program of study.

	Units
Core: Agri 200, 201, 220	9
Required Courses:	
Chem 260 Adv Research Tech	3
Agri 229 or Chem 280	1+1
Approved Electives appropriate to individually designed program (200 or 100 level courses in agricultural science or related areas.) Minimum of 6 units of 200 series coursework	12
Culminating Experience:	
Agri 299 or Chem 299 (Thesis and defense)	4
Total minimum requirements	30

Graduate Advising Notes:

1. Several of the 200-level and approved elective courses have prerequisites other than courses listed as admission requirements.
2. Students should request specific information concerning the master of science degree and the program advising sheet from the department office.
3. Upon admission, students should see the department graduate coordinator for aid in program planning, selection of graduate adviser and selection of a thesis committee.
4. To progress through the graduate program, the student must:
   a. Maintain a minimum of 3.0 GPA.
   b. Complete all prerequisite coursework.
   c. Attain classified standing.
   d. Meet the university writing skills requirement.
   e. Pass a written departmental qualifying examination.
   f. File for advancement to candidacy.

g. Complete the program requirements.
h. File a master thesis committee assignment form.
i. Formally present and defend the thesis results.

5. Advancement to candidacy requires the completion of 9 program units in residence, a minimum GPA of 3.0, meeting the university writing skills requirement, passing the departmental qualifying examination and filing a petition for advancement to candidacy a minimum of one semester prior to enrollment in thesis and within the deadline.
6. The student shall meet the university writing requirement by earning a minimum of 450 verbal on the GRE. If a minimum of 450 verbal is not achieved, the student shall meet the requirement by then earning a score of 80 or higher on the university writing competency examination or by earning a *B* or better in a designated *W* course to be specified by the graduate committee of the School of Agricultural Sciences and Technology.
7. Students in the Agricultural Chemistry Option may apply a maximum of 2 units of independent study to their program. Students in the Food Science and Nutrition Thesis Option may apply a maximum of 3 units of independent study to their program.
8. Students in the Food Science and Nutrition Plan C Option must successfully complete a final comprehensive examination consisting of two parts: a) a general written examination covering the broad areas of the student's program; b) an oral and/or written examination covering the results of the required student independent study project (Agri 290). See Department Policy Statement — Plan C Comprehensive Examination.
9. See *Division of Graduate Studies and Research* in this catalog for university requirements.

COURSES

Note: Active immunization against tetanus (available through Student Health Services) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the University Farm.

Dairy Industry (D Ind)

23. Dairy Foods and Man (3). The history and geography, processes and processing of dairy products; their description, composition and nutritive values; current role of the dairy industry and dairy foods. (Field trips)

80. Undergraduate Research (1–4; max total 4). Open to freshmen and sophomores with permission of instructor. Exploratory work on a suitable agricultural problem in dairy industry. Approved for *SP* grading.

103. Manufacturing Dairy Products (3). Prerequisite: D Ind 23; junior standing. Making common varieties of cheese, mix making and freezing desserts, churning butter, and culturing dairy products. (2 lecture, 3 lab hours; field trips)

113. Dairy and Food Plant Sanitation (3). Prerequisite: D Ind 23; Micro 20 or equivalent, or permission of instructor. Food plant sanitation as related to food safety. Public health issues. Requirements of regulatory agencies. Cleaning, sanitational procedures, housekeeping and waste disposal. (Field trips)

143. Market Milk Products (3). Prerequisite: D Ind 23. Market milk production, marketing, processing and distribution; common laboratory practices and processing methods. (2 lecture, 3 lab hours; field trips)

153. Dairy Inspection (3). Prerequisite: D Ind 23 or permission of instructor. Application of the California Agricultural and the United States Public Health Codes to the inspection of dairies, dairy plants and dairy products. (Field trips)

160T. Topics in Agriculture (1–4; max total 6 per discipline if no topic repeated). Prerequisite: junior standing, permission of instructor. Dairy industry. Topics may require lab hours.

180. Undergraduate Research (1–4; max total 4). Open to juniors or seniors with permission of instructor. Exploratory work on a suitable agricultural problem in dairy industry. Approved for *SP* grading.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

Enology (Enol)

15. Introduction to Enology (3). History and development of the wine industry; mechanics of various processes and factors affecting wine quality and consumer acceptance.

25. Wine Evaluation Techniques I (2). Parameters which determine sensory quality in wines. Principles of wine appreciation.

35. Wine Evaluation Techniques II (2; max total 4). Prerequisite: Enol 25 or equivalent. Critical sensory evaluation of various wine types and styles including premium varietals.

100. Winery Practice (3). Prerequisite: Enol 15; Chem 8 or concurrent. Pilot plant experience in wine making operations, including harvest, scheduling, crushing, fermentation, safety, sanitation procedures, record keeping, analysis and operation of enology facility equipment. (1 lecture, 6 lab hours)

101. Fermentation Laboratory (1; max total 4). Prerequisite: Enol 15 or concurrent. Vinification/Fermentation Laboratory practice at the CSUF Enology Pilot Plants. Individual wine making. Required every fall semester of all Enology majors not enrolled in Enol 100, 165, 194 or 196. Students must supply their own grapes. (3 lab hours)

102T. Topics in Sensory Evaluation of Wines (1–6; max total 6 if no topic repeated). Prerequisite: Enol 15 and 35; Enol 100 recommended. Critical evaluation of selected varietal wines with regard to appellation of origin, vintage and wine-making practices. (15-hour weekend lecture-demonstration)

104. Review of Award Wines (1: max total 4). Prerequisite: Enol 35. Professional wine judging. Choice of panelists. Award process. Presentation of wines which have received awards at recent judgings. (Must be 21 years of age or older — State Law). (Former Enol 102T section)

105. Advanced Sensory Evaluation of Wines (3). Prerequisite: Enol 35, 115 (or concurrent). Factors affecting the quality of wines in terms of growing region, grape maturity, harvesting, vinification, cellaring, blending and storage practices; attributes and defects in premium varietals. Statistical concepts. (2 lecture, 2 lab hours)

110. Enological Science (4). Prerequisite: Chem 8, 150; Enol 15, 165; Micro 104; VTF 104. Critical study of chemical and biochemical interactions in wine making.

115. Wine Analysis (4). Prerequisite: Chem 105; Enol 100 or 165. Principles and practices of wine and fermented beverage analysis. (2 lecture, 6 lab hours)

125. Wine Microbiology (4). Prerequisite: Enol 15; Micro 104; Chem 150 or FScN 110 recommended. Identification, physiology, and biochemistry of bacteria and yeasts involved in wine making and spoilage of wines. Vinous and malo-lactic fermentations. Sherry organisms and other film yeasts. (2 lecture, 4 lab hours)

135. Field Studies (2; max total 4). Prerequisite: Enol 15 or permission of instructor. A six-day field trip during the spring recess visiting wineries to study the techniques and handling methods employed by the many vintners.

145. Brandy Production (3). Prerequisite: Enol 100; Chem 101 or 109 or I T 112 recommended. Distillation principles and practices for the production of brandy and other distilled beverages. Raw materials, aging and sensory evaluation. Students may be required to purchase supplementary materials for class use. (2 lecture, 3 lab hours)

155. Winery Equipment (2). Prerequisite: Enol 100. Description and specifications of modern commercial winery equipment. Principles of operation. Layout and cost. (1 lecture, 3 lab hours)

160. Fruit Wine Production (3). Prerequisite: permission of instructor. Theory and practice of fruit wine production. Harvesting, selection, grading and fermentation techniques. Use of enzymes. (1 lecture, 6 lab hours)

162T. Topics in Enology and Fermentation Science (1–4; max total 12 if no topic repeated). Prerequisite: Enol 15. Topics in wine making and fermentation science. Some topics may include labs.

165. Wine Technology (3). Prerequisite: Enol 100 or 160. Technological study of winery equipment; evaluation, location and operation; sanitation procedures. (2 lecture, 3 lab hours; 3- or 4-day field trip)

173. Wine Marketing (2). Prerequisite: Enol 35, 100; Ag Ec 1. Marketing principles as applied to wine. Role of wholesalers, distributors, retailers, cooperatives. Advertising. Regulations. Interstate and international trade. (Former Enol 162T section)

175. Winery Management (3). Prerequisite: Enol 15 and permission of instructor. Physical properties of a winery; administrative organizational set-up; personnel; purchasing, packaging and shipping; local, state and federal regulatory statutes.

178. Regulations — Wine and Brandy (2). Prerequisite: Enol 100. BATF and other agencies. Rules and regulations concerning wine and brandy. Licensing. Record keeping, taxation, enological practices, rule making. Viticultural areas and appellations. Interstate and international commerce. Export requirements.

180. Undergraduate Research (1–4; max total 4). Prerequisite: Enol 100. Open to juniors or seniors with permission of instructor. Exploratory work on a suitable agricultural problem in enology. Approved for *SP* grading.

185. Cellar Operations (3). Prerequisite: Enol 165. Survey of cellaring operations and equipment; blending; fining; ion exchange; finishing; and bottling. (2 lecture, 3 lab hours; local field trips)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Wine Marketing Internship (2–8; max total 8). Prerequisite: Enol 173; Enol 105 and Ag Ec 164 recommended; approval of internship committee. Emphasis on development of decision-making ability through marketing organization experience integrated with principles acquired in the classroom. *CR/NC* grading only.

194. Enology Internship (1–8; max total 8). Prerequisite: junior or senior standing and approval of internship committee. Emphasis on development of decision-making ability through industrial experience integrated with basic principles acquired in the classroom. *CR/NC* grading only.

195. CSUF-UCD Cooperative Wine Talks (1; max total 2) Prerequisite: junior standing. Wine industry seminars conducted in cooperation with UC Davis Department of Viticulture and Enology, hosted alternately by CSUF and UC Davis during the spring semester. (16-hour weekend seminar)

196. Enterprise Management (1–6; max total 6). Prerequisite: Enol 100, 115, 155, 175, 185; VTF 104; AET 109; I T 102 and 112 recommended. Application of management principles in wine production. Operation of the CSUF commercial winery. Open only to Enology majors or to Viticulture majors with the appropriate background.

199. Undergraduate Seminar (1; max total 2). Prerequisite: senior standing. Oral presentations of topics of current interest in enology, wine grapes and fermentation science.

Food Science and Nutrition (FScN)

1. Introduction to Food Science and Technology (3). Modern food processing; world food problems; basic characteristics of processed foods and the technology of their production.

30. Microcomputers in Food and Nutrition (2). An introduction to the use of the microcomputer in food and nutrition. Management of data through dietary analysis, spreadsheet and word processing programs. (1 lecture, 2 lab hours)

48. Nutrition in the Life Cycle (3). Nutritional requirements during prenatal period, infancy, childhood, adolescence, and young/middle/older adult with emphasis on social, psychological, cultural and clinical factors. (Former FScN 148)

50. Basic Foods (3). Introduction to high quality food. Emphasis on principles of food safety, nutrition, food preparation, and sensory evaluation. (2 lecture, 2 lab hours) (CAN H EC 8)

52. Diet Therapy (3). Not open to Dietetic and Food Administration majors. Introduction to normal nutrition and diet related to disease.

53. Nutrition and Health: Realities and Controversies (3). Optimal nutrition to reduce the risk of cancer, heart disease, allergies, obesity and other diseases. Social, psychological and cultural dictates that affect food selection and health. Personal strategies to develop a nutrition plan for better health. General Education BREADTH, Division 4. (CAN H EC 2)

54. Elementary Nutrition (3). Elementary knowledge of high school chemistry and biology strongly recommended. Scientific principles underlying normal nutritional requirements.

56. Food for Health (3). Planning a nutritious diet implementing the Dietary Goals for the United States and Dietary Guidelines for Americans. Cooking principles, recipe modification and food selection at supermarkets and restaurants to increase dietary complex carbohydrates and decrease fat, sugar and sodium. (2 lecture, 2 lab hours)

80. Undergraduate Research (1–4; max total 4). Open to freshmen and sophomores with permission of instructor. Exploratory work on a suitable agricultural problem in food science. Approved for *SP* grading.

100. Food Appraisal and Evaluation (3). Prerequisite: intermediate algebra; FScN 1. Analysis, measurement and methods used in sensory evaluation of foods. (2 lecture, 3 lab hours)

110. Food Chemistry and Biochemistry (4). Prerequisite: Chem 150 (or concurrent); D Ind 23 or FScN 1. Chemical and biochemical changes in foods during production, processing and utilization. (3 lecture, 3 lab hours)

125. Food Laws and Regulations (3). Prerequisite: junior or senior standing. Federal and state laws and regulations pertaining to the food industry, including product liability and recall systems. (Former FScN 162T section)

130. Food Analysis (4). Prerequisite: one year of general chemistry, Chem 105; D Ind 23 or FScN 1 (FScN 110 recommended). Principles of food analysis; sampling, separation, physical measurements, chemical and biochemical techniques. (2 lecture, two-3 hour labs)

131. Introduction to Food Systems Management (3). Prerequisite: FScN 50. Responsibilities in organization and administration of the quantity foodservice establishment. Emphasis upon menu planning, recipe standardization, supervision of personnel and computer applications. (Former FScN 155)

132. Food and Equipment Purchasing (3). Work simplification; plant layout; selection, procurement and maintenance of equipment and furnishings for foodservice units. Quantity food selection, specifications and purchasing. (Former FScN 156)

133. Quantity Food Production (3). Prerequisite: FScN 131, 132 and 150; health clearance and health and accident insurance required. Preparation and service of conventional and convenience foods in patient and nonpatient foodservice. Emphasis on human relations, food safety and sanitation, production controls, work simplification, quality assurance and energy conservation. (2 lecture, 3 lab hours) (Former FScN 158)

134. Cost Analysis in Food Systems Management (3). Prerequisite: FScN 133; Acct 4A. Advanced concepts of planning, analyzing, decision making and reporting procedures unique to food systems management. Emphasis on cost analysis and cost control in institutional and commercial operations. (Former FScN 162T section)

135. Institutional Experience (3). Prerequisite: FScN 134; health clearance and health and accident insurance required. Supervised work experience in food systems management. (1 lecture, 4 lab hours) (Former FScN 159)

141. Food Unit Operations I (3). Prerequisite: Chem 8 (or concurrent), D Ind 23 or FScN 1. Basic and applied processing systems for fruit, vegetables, frozen and fermented foods; facilities and equipment; scheduling and control of operations; postharvest operations; computer, instrumental and traditional methods of quality control for composition, costs, color, flavor, body and texture; packaging. (2 lecture, 3 lab hours; field trips) (Former FScN 140A–B)

142. Food Unit Operations II (3). Prerequisite: Chem 8 (or concurrent), D Ind 23 or FScN 1. Basic and applied processing systems for lipids, proteins and carbohydrates; formulated foods and food ingredients; equipment, facilities, science, technology and packaging required for the production and use of these foods. (2 lecture, 3 lab hours; field trips)

147. Nutrition and the Athlete (3). Prerequisite: Phy 33. Physiological principles underlying normal nutritional requirements and the application of these principles to athletic performance. Role of diet in training. (Former FScN 162T section)

149. Food and Nutrition Resources (3). Prerequisite: FScN 50 and 54. Counseling techniques for the dietitian. Selection of food and nutrition content and learning activities for a variety of teaching situations including the classroom, community, or clinic setting. Activities include writing lesson plans, developing instructional materials, and presenting lessons.

150. Advanced Foods (3). Prerequisite: FScN 50; Chem 3A. Experimental approach to foods emphasizing sensory and objective tests, standards for high quality foods and scientific principles which affect food preparation and product development. (2 lecture, 3 lab-discussion hours)

151. Experimental Food Study (3; max total 6). Prerequisite: FScN 150. Principles, procedures, sensory and objective evaluation methods necessary to organize professionally and carry through a food research project. Lectures, demonstrations, individual research and field trips. (1 lecture, 4 lab-discussion hours)

153. Advanced Nutrition (3). Prerequisite: FScN 54; Chem 150. Present knowledge of the metabolism of carbohydrates, fats, proteins, vitamins and minerals. Dietary evaluation. Identification and characterization of nutrients in foods; experiments on their digestion and metabolism.

157A. Diet in Disease (3). Prerequisite: FScN 54; Phy 64, 65; Chem 150 (or concurrently). Exploration of nutritional aspects and dietary treatment of disease. (Former FScN 154)

157B. Diet in Disease (3). Prerequisite: FScN 157A. Advanced concepts of nutritional therapy in disease with emphasis on calculation of nutrients for modified diets. (Former FScN 154)

160. Meal Management (3). Prerequisite: FScN 50. Principles of foods and nutrition applied to meal planning, preparation, and service for various cultural groups. Computerized diet analysis. Economic, aesthetic, nutritional, and managerial aspects of meal planning. (2 lecture, 2 lab hours)

162T. Topics in Food, Nutrition and Dietetics (1–4; max total 12 if no topic repeated). Prerequisite: FScN 50, 54. Topics relating to food, nutrition and dietetics. Some topics may have labs.

163. Beverage and Juice Concentrate (3). Prerequisite: Enol 15 or FScN 1; VTF 1 recommended. Principles and practice of fruit juice and concentrate production. Vacuum pan operation, essence recovery. (2 lecture, 2 lab hours; field trips) (Former FScN 162T section)

166. Community Nutrition (3). Prerequisite: FScN 54. Survey of existing federal, state, and local food assistance programs. Proposal writing and subsequent steps in establishing a new program.

169. Nutrition and the Consumer (3). Prerequisite: FScN 53 or 54. Consumer's view of nutrition; factors influencing food choices. Evaluation of dietary guides and popular nutritional issues.

170. Food Microbiology (3). Prerequisite: D Ind 23 or FScN 1; Micro 20. Control of microorganisms, including pathogens, in production and handling of foods. Food spoilage organisms and microbiological methods of examining foods. (2 lecture, 3 lab hours)

180. Undergraduate Research (1–4; max total 4). Open to juniors or seniors with permission of instructor. Exploratory work on a suitable agricultural problem in food science. Approved for *SP* grading.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

192. Readings and Conference (1–3). Prerequisite: permission of instructor. Individually directed readings; reports and evaluation. (hours arranged)

193. Supervised Work Experience (1–6; max total 6). Prerequisite: second semester junior standing and permission of instructor. Supervised work experience in one of the following areas: dairy industry, dietetics, food science and nutrition. *CR/NC* grading only.

GRADUATE COURSES

(See *Course Numbering System.*)

The following graduate courses are open to students who have been accepted into the graduate program. Students who are not in graduate standing should contact the department graduate coordinator prior to enrolling.

Agriculture (Agri)

200. Biometrics in Agriculture (3). Prerequisite: Math 101 or Plant 99; permission of instructor. Advanced concepts in the design of agricultural experiments. Emphasis is placed on the selection of appropriate designs to meet the objectives of well-planned experiments. Relative merits of various designs and topics in analysis, interpretation, and regression are covered.

201. Agricultural Laboratory Techniques (3). Prerequisite: One of the following courses: Bot 104; Chem 105, 109, 151; Enol 115 or FScN 130. Agricultural problem solving through the application of advances in laboratory technology, crop management, foods, nutrition, soil and water quality. Theory and practice operation of scientific instruments and techniques are taught. Student-defined project and report required. (2 lecture, 3 lab hours) (Former Agri 250T section)

203. Advances in Food Processing (3). Prerequisite: FScN 141, AET 109 or Enol 165. Advanced studies in food processing: canning, freezing, dehydration, fermentation, and food preservation. (Former Agri 221T section)

204. Food Carbohydrates and Sweeteners (3). Prerequisite: Chem 150; FScN 110 or 150. Advanced studies in the chemical and biochemical changes of food carbohydrates during processing and storage; quality control; nutritional aspects. (Former Agri 221T section)

205. Food Lipids (3). Prerequisite: Chem 150; and FScN 110 or 150. Advanced studies in the chemical and biochemical changes of food lipids during processing and storage. Mechanisms of formation and degradation. Importance in flavor and texture; quality control; and nutritional aspects. (Former Agri 221T section)

209. Vitamins and Biocatalysts (3). Prerequisite: Chem 150; FScN 110 or 150. Mechanisms of action of vitamins, coenzymes, and cofactors in biological transformations involving food processing and human nutrition. (Former Agri 221T section)

220. Research Communications in Agriculture (3). Prerequisite: completion of university writing skills requirement. Emphasis on critical literature review, scientific writing, and oral presentation of research results. Approved for *SP* grading.

We have to reach out and demonstrate our services and connect in many, many ways with the academic life of this university.

Michael Gorman
Dean, Library Services

221T. Topics in Food Science and Nutrition (3; max total 9). Prerequisite: upper-division food science and nutrition course appropriate to study topic; permission of instructor. Advanced studies in a given area of food science and nutrition. Some topics may require lab hours.

222. Advanced Food Fermentations (3). Prerequisite: Chem 150, Micro 104, 130, FScN 170. Recommended: D Ind 113. Chemical, biochemical and physiologic processes of microorganisms important in food production. Lectures and lab demonstrations. (Former Agri 221T section)

223. Human Nutrition (3). Prerequisite: FScN 153, Chem 150. Review and discussion of the recent scientific literature in nutrition, physiological chemistry and medicine. (Former H Ec 250T section)

224. Clinical Nutrition (3). Prerequisite: FScN 153, 157A, 157B and Chem 150. Recent developments in the treatment of disease through modification of the normal diet. Nutritional assessment. (Former H Ec 250T section)

226. Special Issues in Food Science and Nutrition (3). Prerequisite: graduate standing. Current issues in food science and nutrition from a nutritional, consumer, agricultural, and business perspective.

229. Seminar in Food Science and Nutrition (1; max total 4). Prerequisite: permission of instructor. Investigation of current research and problems related to food science and nutrition. Oral and written reports.

290. Independent Study (1–3; max total 3) See *Academic Placement — Independent Study.* Approved for *SP* grading.

299. Thesis (2–6; max total 6). Prerequisite: prior advancement to candidacy. See Criteria for Thesis and Project. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE *(Agri)*

(See *Course Numbering System.*)

300. Topics in Agriculture (1–3). Topics may require lab hours. In-service professional training in selected areas of agriculture.

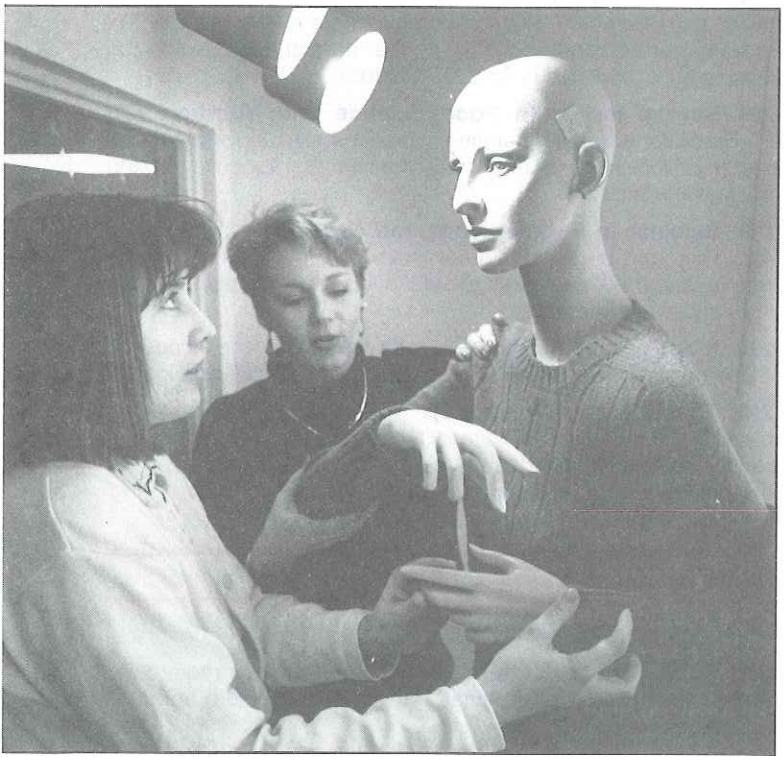
AGRICULTURE
Family Studies and Home Economics

School of Agricultural Sciences and Technology
Department of Family Studies and Home Economics
Nina J. Dilbeck, Chair
Art Home Economics Building, Room 204
(209) 278-2283

B.A. in Home Economics
Minor in Home Economics
M.S. in Home Economics

Programs of study:

Child and Family Studies
Clothing and Textiles
Fashion Merchandising
Foods in Business
Consumer Science and Housing
General Home Economics
Home Economics Teacher Education



The Home Economics program is accredited by the American Home Economics Association.

The Department of Family Studies and Home Economics is housed in the Art-Home Economics Building on the west side of the campus. Two well-equipped laboratory rooms as well as several showcases facilitate learning for students in the clothing and textiles, fashion merchandising area. The consumer science and housing students utilize laboratory facilities for demonstration of household equipment.

Day care facilities for the infant-toddler laboratory, preschool laboratory and after school children are maintained for instructional purposes. Students plan, implement and evaluate activities for the children. Computer facilities are also available in the building. The laboratories also service other departments on campus who use these facilities for observational purposes.

Career Opportunities

Career opportunities for home economists are available in the concentrations of child and family studies, clothing and textiles, fashion merchandising, foods in business, consumer science and housing, general home economics and home economics teacher education. Students may qualify for these career opportunities by selecting appropriate electives in their special area of interest. Students must consult with a departmental academic adviser in selecting appropriate courses for their special areas of interest. Appropriate selection of courses offered in the concentrations listed below provide the necessary background to prepare students for careers as home economists.

Child and Family Studies. Courses focus on individual and family development through the life cycle with analysis of the forces affecting personal and family development and relationships. Career possibilities include: elementary teacher (this requires a credential), child care consultant, child advocate, administrator of family services and child care program administrator.

Clothing and Textiles. Courses prepare students for careers such as textiles technician, product and research evaluator, product promoter, industry or trade association representative, museum costume curator, textile conservator, space program consultant and cooperative extension agent.

Consumer Science and Housing. Courses focus on the family as a social and economic unit and prepare students for careers as consumer affairs professionals with banks and finance companies, home service advisers, consumer representatives in business and consumer relations specialists. Other opportunities include work in product testing and research, debt counseling, government agencies, cooperative extension, communications and equipment consultant services.

Fashion Merchandising. Courses focus on the many facets of the apparel industry, display techniques, social and psychological aspects of clothing, clothing construction, and fashion analysis, as well as practical application through working in the industry. Career opportunities are found in retail, wholesale and private apparel industries.

Foods in Business. Courses prepare students for careers as a sales representative for manufacturers of cookware and kitchen appliances, menu consultant, manager of food services, food broker, food stylist, food editor, spokesperson or market researcher.

General Home Economics. Courses prepare students for such careers as Cooperative Extension Service agents or specialists, and 4-H youth agents.

Home Economics Teacher Education. Courses under the credential program focus on the preparation of teachers, who will teach in public schools and professionals who will serve as consultants in business and government.

Faculty

Nina J. Dilbeck, *Chair*

Carolyn B. Jackson, *Graduate Coordinator*
Dianne K. DeVries, *Clothing and Textiles Coordinator*
William R. Fasse, *Consumer Science and Housing Coordinator*
William C. Rice, *Child and Family Studies Coordinator*
Dianne K. DeVries, *Fashion Merchandising Coordinator*
Elena F. Kissick, *Foods in Business Coordinator*
Frances H. Harkins, *Home Economics Education Coordinator*

Richard D. Berrett
Shirley J. Bowden
N. Joanne Caid
Dianne K. DeVries
Nina J. Dilbeck
William R. Fasse
David E. Goldbloom
Frances H. Harkins
Carolyn B. Jackson
Michele M. Kilner
Elena F. Kissick
Eugene Wm. Krebs
Judith L. Kuipers
Vivian Y. Kunimitsu
William C. Rice

The faculty members are highly qualified professionals with advanced degrees from universities across the nation. They bring practical insights and experience to the classroom through local and national professional activities: owning and directing child development centers, operating counseling centers, consulting, serving on advisory boards and participating in workshops. Students find departmental faculty vitally helpful in guiding them through their academic experience as well as helping them pursue career goals.

Bachelor of Arts Degree Requirements
Home Economics Major

Units

General Education (including 9 upper-division units) 51–52
- CORE
  - Category 2: Spch 3 (recommended)
  - Category 3: Psych 42 or Math 11 (recommended) for child and family studies.
- BREADTH
  - Division 1: Chem 3A (required for clothing and textile, foods in business and home economics teacher education)
    Chem 3B (recommended for child and family studies)
  - Division 2: Zool 10 (recommended for child and family studies)
    Biol 10 (required for home economics teacher education, foods in business, clothing and textiles and child and family studies)
  - Division 3: Psych 10 (required for home economics teacher education, foods in business, clothing and textiles)
  - Division 4: FScN 53 or CFS 38 (recommended); H S 124, Psych 132 or Psych 171 (recommended for child and family studies)
  - Division 8: Soc 2 (recommended for child and family studies)
    Ag Ec 1 (required for clothing and textiles, consumer science, foods in business, fashion merchandising, home economics teacher education)
- CAPSTONE
  - Juveniles and Adolescence Cluster (recommended): Crim 120 and CFS 136 (recommended) or Psych 102

Major (including 24 upper-division units) 48
- Department Core ..... (18)
  - H Ec 1; and select one course from each area: CFS 108 or 131; F M 20 (required for C & T and F M) or 120; CSH 105 or 113; FScN 50, 53, or 54; GID 70, 107, or CSH 116 (NOTE: H Ec 1, F M 20, FScN 54, GID 70, CSH 113 or 115, and CFS 131 required for home economics teacher education)
- Career Specialty (select one): ..... (30)
  - Child and family studies:
    CFS 32, 37, 39, 131, (if not taken in the core), 133, 134, 135, and 9–12 upper-division units in consultation with adviser
  - Clothing and textiles:
    CSH 105, GID 70 (if not taken in the core); F M 22, 24, 26, 120, 121, 123, 124, 126 and 2–8 upper-division units in consultation with adviser
  - Consumer science and housing:
    CSH 105 (if not taken in the core), 110, 111, 113, 114, 115, 116, 117, 118 and 3–6 upper-division units in consultation with adviser
  - Fashion merchandising:
    F M 22, 24 or 26, 120, 124, 126, 127, 128, 129 (F M 20, CSH 113, GID 107, if not taken in core); and 2–8 upper-division units in consultation with adviser
  - Foods in business:
    FScN 48; FScN 50 (if not taken in core), FScN 53 or FScN 54 (if not taken in core); FScN 131 or 132, 150, 151, 133 or CSH 114; FScN 160, 169, and 5–6 upper-division units in consultation with adviser
  - General home economics:
    Minimum 6 units from each discipline: CFS, CSH, F M, FScN, GID (Selection of courses in consultation with adviser)
  - Home economics teacher education:
    (See Single Subject Credential Waiver Program below)

Additional requirements 1–21
- Upper-division writing skills (by examination or course)
- Clothing and Textiles:
  Chem 3B
- Consumer Science and Housing:
  Econ 40 or Ag Ec 1, and Econ 50 or Ag Ec 2
- Fashion Merchandising:
  Acct 3 or 4A, Econ 40 or Ag Ec 1, and Econ 50, Mgt 104 or 106 or 110, Mktg 100, 130, 138
- Foods in Business:
  Acct 4A, Chem 8, Mktg 100, 132 or 138; Mgt 104

Electives 3–24
- (Courses supplementary to the major strongly recommended)

Total requirements (including 40 upper-division units) 124

Single Subject Credential Waiver Program

Students who successfully complete the Single Subject Credential waiver program are not required to take the NTE (See Teacher Education — General Requirements for Initial Admission and Requirements for Admission to Student Teaching). The

Single Subject Credential waiver program in home economics consists of Core F M 24 or 26, 121, FScN 50, GID 107; CSH 114; CFS 136; Breadth: CSH 116, 117, CFS 135, 139; FScN 169. Additional requirements by the Commission on Teacher Credentialing include: H Ec 148, 241; T Ed 134, 151, 152, 155A, 155B, 156, 159, 161; H S 121; and A S 111.

Advising Notes:

1. New students should request a program of study check sheet from the department.
2. All students should make an appointment with an assigned academic adviser prior to registration each semester. Check with department for academic adviser assignment.
3. *CR/NC* grading is not permitted in courses used to fulfill major requirements.
4. Upper-division units (i.e., 100 level courses) may not be applied toward the 40 upper-division unit degree requirement until 45 units have been completed.
5. Career objectives should be selected on basis of individual interest.
6. The upper division writing skills requirement can be met by passing the university examination or by taking an approved upper-division writing skills course only after completion of 56 units. One unit of credit (i.e., English 100W) may be earned upon request for passing the examination; by obtaining a letter grade of *C* in an approved course the student meets the university writing skills requirement.
7. General Education courses designated as required by the department are prerequisites to many courses in the program of study.
8. One semester prior to graduation make an appointment with an assigned academic adviser to prepare and file an official certification of major requirements.

Minor

A minor in home economics consists of 21 units of which 9 must be upper division. At least 12 units must be taken in a particular department and/or discipline. The minor program must be certified by the department chair and the school dean. The certified minor program is filed with the university Office of Evaluations.

Master of Science Program

The Master of Science in Home Economics with an option in education is a 30-unit program designed to increase the competencies of secondary school teachers and other home economics related teachers for positions in two- and four-year colleges, and to provide the foundation that will qualify some to pursue the doctoral degree. Through appropriate choice of courses students may concentrate their programs of study in any one of the areas of home economics: child development and family relations, clothing and textiles, fashion merchandising, and consumer science and housing. Graduate courses are offered in the late afternoon or evening to accommodate part-time students. Full-time graduate students may earn their degree within two years when working closely with an adviser.

Admission Requirements

The Master of Science degree in Home Economics assumes preparation equivalent to a Bachelor of Arts degree in Home Economics.

Students who have not completed a Bachelor of Arts degree in Home Economics are expected to have completed the following prerequisite courses or their equivalents prior to enrollment in courses to be applied to the master's program:

H Ec 1, Contemporary Home Economics

Select one course from each area:

CFS 38, 39, 108, 131;
CSH 105 or 113;
F M 20 or 120;
FScN 50, 53, or 54;
GID 70, 107 or CSH 116.

Admission by the university does not imply acceptance in the Master of Science in Home Economics program.

Applicants whose preparatory education was principally in a language other than English must earn a minimum TOEFL score of 550.

Full classified standing requires a baccalaureate degree in home economics from an accredited institution; a 3.0 GPA (last 60 semester units); either a 450V/430Q GRE score or 880 combined score; completion of all prerequisite coursework; separate school application; three letters of reference, and a statement of 500 words or less.

Conditional classified standing may be granted by the department to petitioning applicants with a 2.5 to 3.0 GPA (last 60 units); GRE scores on file with the university Testing Office; separate school application; three letters of reference, a statement of 500 words or less, and a maximum of 21 units of prerequisites (consult with graduate coordinator for specific prerequisite foundation courses). Prerequisite coursework is not included in the 30-unit master's program. Students must request full classified status in the program by the semester in which a minimum of 10 units to be used toward the degree are completed.

Prerequisite Requirements

An introductory statistics course, such as Math 11, Soc 25, or Psych 42.

Program Requirements

Home Economics Education Option

The student, under the direction of a graduate adviser, prepares and submits a program individually designed within the following framework:

	Units
Core:	9
H Ec 201, 241 and 243	
Electives: (In consultation with an adviser)	15
H Ec 200-series courses in specialized area (3 units), 100–200 level (12 units) courses, in home economics or related areas, with a maximum of 6 units at 100 level.	
Culminating Experience:	6
Project or Thesis: H Ec 298 or 299	
Total minimum requirements	30

Graduate Advising Notes:

1. Several of the 200-level and approved elective courses have prerequisites other than courses listed as admission requirements.
2. Students must request specific information concerning Master of Science degree or program advising sheet from the department office.

3. Upon admission, students should see the department graduate coordinator for aid in program planning, selection of graduate adviser and selection of a thesis committee.
4. To progress through the graduate program:
   a. The student must maintain a minimum of 3.0 GPA.
   b. Complete all prerequisite coursework.
   c. Attain classified standing.
   d. Meet university writing requirement.
   e. File for advancement to candidacy.
   f. Complete the program requirements.
   g. File a master thesis or project committee assignment form.
   h. And formally present and defend the thesis/project research results.
5. Advancement to candidacy requires the completion of 9 program units in residence, minimum 3.0 GPA, meeting the university writing skills requirement and filing a Petition for Advancement to Candidacy a minimum of one semester prior to enrollment in thesis/project and within the deadline.
6. The student shall meet the university writing requirement by earning a minimum of 450 verbal on the GRE. If a minimum of 450 verbal is not met by a student, the student shall meet the requirement by then earning a score of 80 or higher in the writing competency examination or by earning a *B* or better in a designated W course to be specified by the graduate committee of the School of Agricultural Sciences and Technology.
7. See *Division of Graduate Studies and Research* in this catalog for university requirements.

Master of Science in Agriculture

Food Science and Nutrition (Dietetics)

Students interested in dietetics are referred to the Department of Enology, Food Science and Nutrition for the M.S. in Agriculture, Food Science and Nutrition Option.

COURSES

General (H Ec)

1. Contemporary Home Economics (3). Home economics in America; past and present professional needs, successes and weaknesses; future of the field. Academic preparation for a variety of occupations; participation in the worlds of work, marriage, family and community.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

192. Readings and Conference (1–3). Prerequisite: permission of instructor. Individually directed readings; reports and evaluation. (Hours arranged)

193. Cooperative Education (1–6; max total 6). Prerequisite: completion of at least 45 units, good academic standing and permission of the department. Combines study with paid work experience in a supervised career-related position. Reports and conferences required. *CR/NC* grading only.

Consumer Science and Housing (CSH)

10. Management for Effective Living (3). Human relationships, housing, family finance, consumer problems, meal management and nutrition as they relate to individual and family living. (Former C S 10)

105. Decision Making and Problem Solving (3). Management concepts related to individual careers and family living. Analysis of values, goals, and standards and their relationship to decision making in the allocation of human and nonhuman resources with case studies in problem solving. (Former C S 105)

110. Consumer Buying Strategies (3). Emphasis on consumer buying strategies, sources of information relevant to consumer decision making and the activities and problems of buying goods and services in the marketplace. (Former C S 110)

111. Household Equipment and Energy Use (3). Selection, methods of operation, specifications of household appliances; utilization of energy; energy conservation strategies; kitchen and utility planning. (2 lecture, 2 lab hours) (Former C S 111)

112T. Topics in Consumer Science and Management (1–4; max total 12 if no topic repeated). Current topics relating to consumers and home management; consumers in action (lobbying), financial counseling, product standards and safety, home ownership. Some topics may have labs. (Former C S 112T)

113. Economics for Consumers (3). Prerequisite: Econ 50 recommended. Consumer spending related to social and psychological factors influencing consumers. Legislation that protects and relates to the consumer on local, state and federal level. (Former C S 113)

114. Consumer Science and Family Studies Practicum (3). Prerequisite: permission of instructor. Integrated field experience in various phases of home economics as they apply to Consumer Science and Family Studies. (6 lab hours) (Former C S 114)

115. Family Finance (3). Financial activities of the individual and family; planned spending, bank services, consumer credit, insurance savings, investments, taxes; financial aspects of home ownership and estate planning. (Former C S 115)

116. Consumer Aspects of Home Ownership (3). Emphasis on benefits and obligations of home ownership. Analysis of the consumer processes of selecting, buying and maintaining a home. (Former HIE 116)

117. Resource Management of Aging (3). (Same as Geron 117.) The individual during the later stages of the life cycle with emphasis on the special problems of the elderly in management of personal and community resources. (Former C S 117)

118. Consumer and Family Law (3). A "law-for-the-layman" course. Broad coverage of individual and family rights in the areas of domestic relations, marriage, divorce, parenting, abortion, consumer protection, property rights, liability and court proceedings. (Former C S 118)

171. Housing and Society (3). An analysis of housing alternatives for individuals, families and special groups. Social, legal and economic factors affecting the housing market. Special shelter considerations for the elderly, disabled, single parent and shared households are explored in lecture and field trips. (2 lecture, 2 lab) (Former IDH 171 and C S 171)

Fashion Merchandising (F M)

20. Beginning Textiles (3). Fiber classification, yarn construction, fabric construction and production. Selection, use and care of fabrics in relation to consumer needs. (CAN H EC 6)

22. Fashion Analysis (1). Factors influencing trends in dress. Selection of color, line and form related to individual needs. (CAN H EC 20)

24. Clothing Construction I (3). Pattern and fabric selection; basic construction techniques, use of commercial patterns; application of these factors to consumer buying. (6 lab hours) (CAN H EC 10)

26. Clothing Construction II (3). Prerequisite: F M 24 or experience in clothing construction. Individualization of basic and designer patterns: alteration principles; techniques of handling new fabrics. (6 lab hours)

120. Social and Psychological Aspects of Clothing (3). Prerequisite: F M 22. The psychological, social and economic aspects of clothing as related to the individual, family and society. An understanding of fashion, its development and distribution.

121. Tailoring (3). Prerequisite: F M 22 and 26. Tailoring a suit or coat using various techniques. (6 lab hours)

122T. Topics in Clothing and Textiles (1–4; max total 12 if no topic repeated). Topics relating to clothing, textiles and fashion merchandising. Some topics may have labs.

123. Pattern Design (3). Prerequisite: F M 22 and 24 or 26. Application of flat pattern method to apparel design (6 lab hours)

124. Textile Finishing (3). Prerequisite: F M 20. Finishing, dyeing and printing techniques, material and equipment. Evaluation through standard laboratory tests. (2 lecture, 2 lab hours)

126. History of Costume (3). Important periods of costume; their relationship to political, social and economic conditions of the times and their importance in evolution and inspiration of modern dress.

127. Fashion Merchandising (3). Prerequisite: F M 20, 22; GID 107. Aspects of fashion marketing and fashion related careers. Resource personnel and field trips. (2 lecture, 2 lab hours)

128. Fashion Display Techniques (3). Prerequisite: F M 127. Design fundamentals applied to the aesthetic arrangement of promotional and institutional displays in the retail store. Resource personnel and local field trips. (2 lecture, 2 lab hours)

129. Fashion Merchandising Practicum (3; max total 6). Prerequisite: F M 127, senior standing. Integrated field experience in various areas of fashion merchandising.

130. Fashion Study Tours (3). An in-depth study of industrial, retail and wholesale sites in California. Field experiences are included to ensure optimum learning opportunities. (Course Fee $130) (1 lecture, 4 lab hours)

131. Fashion Entrepreneurship (2). Prerequisite: F M 127. Investigation of start-up procedures, location, financing, supplies, legal implications, target customers, record keeping, promotion and customer relations are covered. (Former F M 122T section)

132. Textile Care (3). Prerequisite: F M 124. The technology of home laundry, laundry aids and equipment, dry cleaning and commercial laundry. Care methods for apparel, furs, upholstery and carpet are investigated. Industry resource personnel and field trips. (Former F M 122T section)

133. Textile/Apparel Economics (3). Prerequisite: F M 20, Econ 40 (recommended). Organization and development of the textile and apparel industries. Aspects of production, consumption and international trade. Analysis of current problems facing the industry and industry's response. (Former F M 122T section)

Child and Family Studies (CFS)

32. Intimate Interpersonal Relationships (3). Analysis of various motivations for intimate relationships, including those which lead to marriage; attitudes, values and behaviors are examined using the interactional framework.

37. Introductory Child Development Practicum (3). Observation and interaction with the young child in a laboratory setting. Utilize a case study to focus on the child's growth and development to gain an understanding of his/her relationship to family, peers and adults. (2 lecture, 3 lab hours)

38. Lifespan Development (3). A balanced study of basic theories, research, applications and principles of physical, cognitive and psychosocial development from conception to death, presented in an integrated manner; includes behavior, sexuality, nutrition, health, stress, environmental relationships and implications of death and dying. General Education BREADTH, Division 4

39. Child Development (3). Physical, intellectual, social and emotional development of the child from conception through adolescence, in the cultural context of the family approached from an interdisciplinary perspective. (CAN H EC 14)

108. The Individual and Family Interaction (3). Individual and family development and interaction, diversity of family life styles and forces that influence family relationships and the quality of life are studied within the family context.

131. Family Relationships (3). Marital and family dynamics are explored within the context of family theories. Topics include love, mate selection, sexuality, communication patterns, parenthood and dissolution.

132T. Topics in Child Development and Family Relationships (1–4; max total 12 if no topic repeated). Prerequisite: CFS 39 and/or 131. Topics relating to child development and family relationships. Some topics may have labs.

133. Children and Family Crises (3). Prerequisite: CFS 39 and 131. Crises experienced by children and their families; child abuse, separation, dissolution, divorce, remarriage and the consequent formation of step-relationships, death, alcoholism, drug abuse, and living with a child with special needs included.

134. Cultural Aspects of Child Rearing (3). Prerequisite: CFS 39 and 131 or CFS 39 and Soc 165. Cultural and subcultural aspects of child rearing; survey of research studies and findings on cultural child-rearing attitudes and practices.

135. Contemporary Parenting (3). Prerequisite: CFS 38, 39 or Psych 101 or permission of instructor. Examination and critique of several contemporary theories of effective adult-child relationships.

136. Middle Childhood and Adolescence (3). Prerequisite: CFS 39 or consent of instructor. Family influences on the physical, intellectual, social and emotional development of children in middle childhood and adolescence. Emphasis on the search for identity, heterosexual development, vocational choice and interpersonal relations. General Education CAPSTONE Cluster.

137. Infant in the Family (3). Prerequisite: CFS 39. A functional and theoretical study of the infant's physical, emotional, social and intellectual development during the first two years of life within the family. (2 lecture, 2 lab hours)

138. Program Plans for Children (3). A study of the various types of organizations and the administration of programs for young children. Principles of administration and policies related to school organization including administrator's responsibilities, staffing, personnel policies, parent programs, curriculum, budgeting, housing, and equipment.

139. Child Development Practicum (3). Prerequisite: CFS 37. Assume the responsibility of a nursery school head teacher; plan learning episodes for the young child based on his or her needs, abilities and interests; work with parents and do diagnostic assessments of children. (2 lecture, 3 lab hours)

Food Science and Nutrition (FScN)

Students interested in foods in business refer to the Department of Enology, Food Science and Nutrition for course listing.

Home Economics Education (H Ec)

148. Occupational Home Economics Program Planning (3). Required for credential candidates. Individualized modules concerning the design, development, implementation and evaluation of home economics related occupational programs.

149T. Topics in Home Economics Education (1–3; max total 12 if no topic repeated; max 3 in one area). Topics include Consumer Science Resources; Organization and Management of Food and Nutrition; Clothing and Textiles and Fashion Merchandising; Housing and Interior Environment; Child Development and Family Relations. Some topics may have labs.

GRADUATE COURSES

The following graduate courses are open only to students who have been accepted into a graduate program. Students who are not in graduate standing, should contact the graduate coordinator prior to enrolling.

Home Economics Education (H Ec)

201. Survey Home Economics Research (3). Examination of research in each area of Home Economics. Consideration of major ideas, trends, and movements in the field. (Former H Ec 240T section, 242)

210T. Seminar in Consumer Science and Family Management (3; max total 12 if no topic repeated). Prerequisite: permission of instructor. Analytical study of problems pertaining to identifiable segments of the populace; intercultural, socioeconomic, age level and ethnic and community groups. Topics such as: Aspects of Aging, Cultural Aspects of Management, Home and Community Relationships, Ergonomics — Aspects of Work Simplification.

220T. Seminar in Clothing, Textiles and Fashion Merchandising (3; max total 6 if no topic repeated). Prerequisite: permission of instructor. Research and analysis of historical material and contemporary developments in clothing, textiles and fashion merchandising. Topics may include aspects of historical costume and textiles, technological developments in textiles, and trends in purveying fashion. Some topics may have labs.

230T. Seminar in Child Development, Family Relations (3; max total 12 if no topic repeated). Prerequisite: permission of instructor. Research, methodology, and issues in family relationships and child development. Course considers seminars in the following: Fatherhood: The Parent Role; Family in Transition, Relational Patterns in Marriage and Family; The Family; Middle and Later Years. Some topics may have labs.

240T. Seminar in Home Economics Education (3; max total 6 if no topic repeated). Prerequisite: permission of instructor. Applied research; current and future trends of vocational, career, and consumer Home Economics Education. Topics include: Administration, Evaluation, and Supervision in Home Economics; and Home Economics in Higher Education. Some topics may have labs.

241. Seminar in Trends and Issues in Home Economics Education (3). Prerequisite: permission of instructor. Background of home economics, its present status, its impact on the future. Individual research in analysis of trends and issues having impact on the family, the individual, and the quality of life.

243. Research Methods in Home Economics (3). Prerequisite: H Ec 201 or equivalent; a statistics course, Math 11 or Soc 25 or equivalent; completion of the university writing skills requirement. Methods, techniques of research; locating and formulating problems; collection and interpretation of data; preparation of research paper; analysis of professional literature. (Former H Ec 200)

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

292. Readings in Home Economics (2–3; max total 6 if no topic repeated). Prerequisite: permission of instructor. Individually directed readings in a field of special concern to students in the graduate program; appropriate reports and evaluations required; individual conferences, no formal class meetings. Approved for *SP* grading.

298. Project (2–6; max total 6). Prerequisite: prior advancement to candidacy. See *Criteria for Thesis and Project.* The project is a significant undertaking of an approved pursuit appropriate to the applied arts, examples: Extensive curriculum design, development of new consumer products, a survey of disappearing textile techniques or similar professional endeavors with written documentation. Abstract required. Approved for *SP* grading.

299. Thesis (2–6; max total 6). Prerequisite: prior advancement to candidacy; see *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

See *Course Numbering System.*

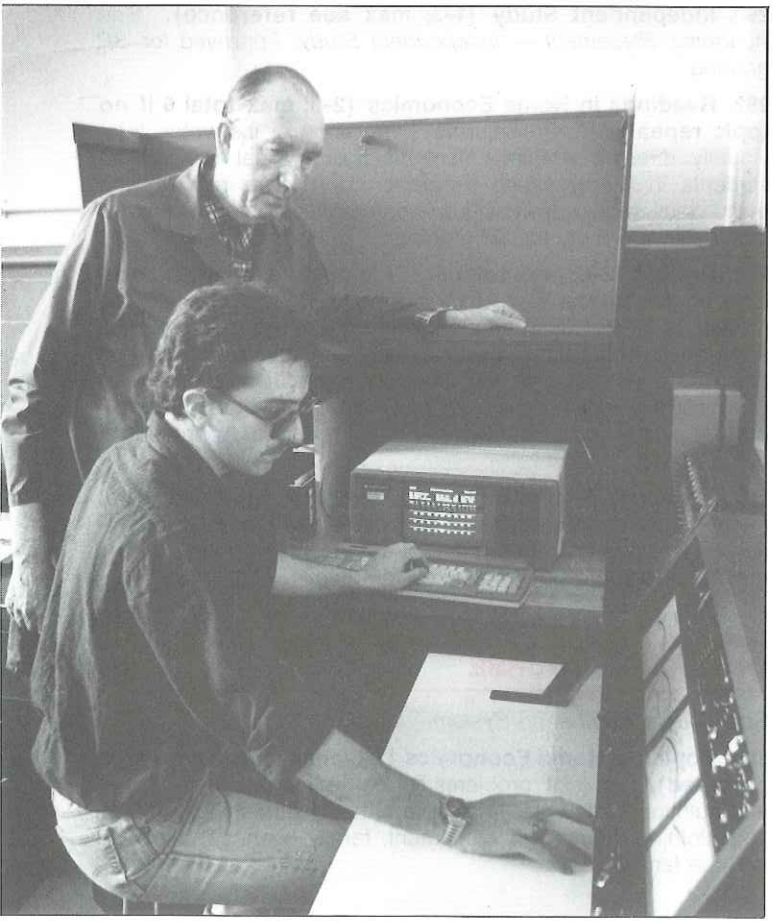
380. Topics in Home Economics (1–3; max total 9 if no area repeated). Special problems in home management, foods and nutrition, child care, housing and home furnishings, textiles and clothing, household equipment, family finances, marriage and the family.

AGRICULTURE
Industrial Technology

School of Agricultural Sciences and Technology
Department of Industrial Technology
Gary E. Grannis, Chair
M. Grosse Industrial Technology Building, Room 212
(209) 278-2145

B.A. in Industrial Arts
B.A. in Interior Design
B.S. in Industrial Technology
Minor in Industrial Arts
M.A. in Industrial Arts
Bachelor of Vocational Education (B.V.E.D.)

Programs of Study:
Architecture
Computer-Aided Design
Computer-Aided Process Planning
Construction Management
Electronic Communications
Graphic Communications
Graphic Design
Industrial Control Electronics
Interior Design
Manufacturing Automation
Materials Processing
Transportation Systems



Individual programs are planned to provide for professional careers in teaching and in business and industry. The industrial arts degree program prepares candidates for careers in teaching and selected industries. The graphic design option within industrial arts prepares individuals to enter the commercial art/advertising design profession. The interior design major prepares individuals for careers related to the interior design profession.

The Industrial Technology program is accredited by the National Association for Industrial Technology. Emphasis is placed on training men and women for construction and industrial management positions. The principal components of the degree are (1) major technology (option), (2) industry specialty, (3) physical science, (4) business management and (5) General Education. The major technology specialty prepares the student for his/her position in the chosen field of industry.

Instructional Facilities

Modern department facilities are equipped with robots, numerical control machines, programmable logic controllers, flexible manufacturing cells and computer graphic work-stations. A modern lighting laboratory is in its final stages of development. IBM's selection of CSUF to join the National Computer Integrated Manufacturing (CIM) Alliance has significantly enhanced the department's ability to deliver instruction using state-of-the-art equipment.

Career Opportunities

Manufacturing and Construction. It is projected that industrial technologists will be in high demand for many years. Industry needs qualified individuals who can contribute to better product reliability, efficiency and improved productivity. Improvement in the economy has also significantly improved the career placement for manufacturing and construction graduates. Examples of positions held by manufacturing graduates are assistant plant engineer, factory representative, fleet service representative, manufacturing engineer, mechanic systems coordinator, operations supervisor, production planning analyst, production scheduling coordinator and quality control supervisor. Examples of positions held by construction graduates are project manager, project engineer, project administrator, estimator, project scheduler, architectural representative, mechanical designer, project superintendent and construction administrator.

Industrial arts teachers are currently in short supply nationwide, including California. The demand is projected to be even greater in the next few years. This demand can be attributed to emerging technologies and expanded applications for industrial and technological education.

Interior Design and Graphic Design. The interior design major has the distinction of being one of only five programs in California accredited by the Foundation for Interior Design Education Research (FIDER). Interior design combines an excellent foundation of color, design, drafting, including computer-aided design (CAD), professional practice, space planning and presentation skills with unique strengths in architecture, construction and materials. Graduates have been placed in interior design firms, architectural firms, construction companies, art galleries, product suppliers, contract and residential showrooms.

The graphic design program trains individuals as graphic artists for such industries as television, printing, newspaper, magazine, film and advertising. Demand for such candidates has been excellent in both small and large businesses.

Faculty

Gary E. Grannis, *Chair*

Frank H. Goishi, *Construction Coordinator*
Kenneth D. Moshier, *Manufacturing Coordinator*
Patricia Hennings-Smith, *Graphic and Interior Design Coordinator*
Ronald L. Blanton, *Teacher Education Coordinator*
Gary H. Winegar, *Graduate Coordinator*

Merle S. Adrian
Leslie L. Aldrich
Tony M. Au
Ronald L. Blanton
Glen H. Blomgren
Nancy K. Brian
Chester E. Christison
Clift C. Cullen
Arthur L. Foston
Edward A. Gaiser
Frank H. Goishi
Gary E. Grannis
Norman A. Gullickson
R. Louis Gysler
Patricia Hennings-Smith
Richard S. Jenne
David E. Leue
Gary K. McCurry
Kenneth D. Moshier
Gary B. Paglierani
Lawrence E. Smith
C. Dennis Spring
Gary H. Winegar
Matthew M. Yen

The faculty are well qualified within their respective areas of instruction and each student is assigned an academic adviser within his/her field of study. The department is recognized for its diversification of faculty representing the makeup of professionals that must interact in the field. Several are recognized for outstanding contributions and leadership within the professions.

Teacher Credential Program

The following breadth courses are required for the Single Subject Waiver Program in Industrial Arts: I T 12, 41, 52, 60, 74, 80, 92 and 102. Additionally, a minimum of 12 units is required from two areas of concentration. Choose from:

Automotive. I T 120, 121, 122, 129
Drafting. Const 42; I T 44, 115, 141, 147
Electricity/Electronics. I T 53, 131, 132, 153, 157, 159
Graphic Arts. GID 165; I T 160, 161, 162
Metals. I T 70, 71, 114, 170, 173, 177
Woodworking. I T 82, 182, 184, 185

For additional requirements, see Teacher Education-Single Subject Credential Program requirements section in this catalog.

Bachelor of Arts Degree Requirements

Industrial Arts Major

Units

General Education (Including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  - Category 3: Math 72 or 75 (required)
- BREADTH
  - Division 1: Chem 3A or Physics 2A (required)
- CAPSTONE
  - Energy and Society Cluster (recommended): I T 106 and Econ 117

Major (including 16 upper-division units) 47
- Industrial Arts Core ..... (23)
  - I T 12, 41, 52, 60, 74, 80, 92, 102
- Concentration requirements ..... (24)
  - Select 12 units in each of two areas of concentration: architecture, computer-aided design, computer-aided process planning, construction management, electronic communications, graphic communications, industrial control electronics, manufacturing automation, materials processing, transportation systems.

Additional requirement 1–3
- Upper-division writing skills (by examination or I T 198W)

Electives (courses supplementary to the major strongly recommended) 23–25

Total requirements (including 40 upper-division units) 124

Advising Notes:

1. All courses required for the major must receive a letter grade, including additional major requirements in General Education.
2. All concentration requirements must receive prior approval by a department adviser.
3. The upper-division writing skills requirement can be met by passing the university examination or by completing I T 198W with a letter grade of *C* or higher, after 56 units are completed.
4. I T 199 may not be applied toward the 16-unit upper-division requirement.

Industrial Arts Major

Graphic Design Option

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  - Category 1: Engl 1 (required)
  - Category 2: Spch 3 (required)
  - Category 3: Math 11 (required)
  - Category 4: Phil 25 or 45 (recommended)
- BREADTH
  - Division 1: Geol 2 (recommended)
  - Division 2: Bot 10 (required)
  - Division 3: Psych 10 (recommended)
  - Division 4: Art 13 (required)
  - Division 5: Art H 11 (required)
  - Division 6: Hum 10 (recommended)
  - Division 7: Fren 1A (recommended)
  - Division 8: Econ 40 or Ag Ec 1 (recommended)
  - Division 9: Soc 131 (recommended)
- CAPSTONE (Upon selection with adviser)

Major 70
- Core ..... (32)
  - I T 41 or Const 42; I T 60, 80, 92, 102; GID 43, 70, 72, 107, 143, 144
- Graphic Design Option ..... (38)
  - GID 142, 146, 147, 148, 165, 177; I T 160, 161; Art 116, and 11 units selected in consultation with your assigned academic adviser

Additional requirement 1–3
- Upper-division writing skills (by examination or W course)

Electives 0–2

Total requirements (including 40 upper-division units) 124

Advising Notes:

1. All courses required for the major must receive a letter grade, including additional major requirements in General Education.

2. Student work may be retained for a limited period for display and accreditation visits.
3. The upper-division writing skills requirement can be met by passing the university examination or by completing a W course with a letter grade of *C* or higher, after 56 units are completed.
4. The General Education requirement of 51 units may be exceeded depending upon the selection of courses, such excess units may be counted under the Electives category toward the 124-unit degree.

Interior Design Major

This program has full accreditation by the Foundation for Interior Design Education Research (FIDER).

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) ..... 55 [4]
- CORE
  - Category 1: Engl 1 (required)
  - Category 2: Spch 3 (required)
  - Category 3: Math 11 (required)
  - Category 4: Phil 25 or 45 (recommended)
  - Category 5: Hist 11 or 12 (required)
  - Category 6: Pl Si 2 or 101 (required)
- BREADTH
  - Division 1: Geol 2 (recommended)
  - Division 2: Bot 10 (recommended)
  - Division 3: Psych 10 (required)
  - Division 4: Art 13 (required)
  - Division 5: Art H 11 (required)
  - Division 6: Hum 10 (recommended)
  - Division 7: Fren 1A (recommended)
  - Division 8: Econ 40 or Ag Ec 1 (recommended)
  - Division 9: Soc 131 (recommended)
- CAPSTONE (Upon selection with adviser)

Major 69
- Design Core ..... (18)
  - GID 70, 72, 107, 177; I T 102; Const 42
- Interior Design Requirements
  - GID 43, 71, 117, 144, 170, 172T, 175A, 175B, 176, 178A, 178B; GID 180 or CSH 171; GID 181, 182; F M 20; Const 31; Const 131 or GID 143; I T 115 ..... (51)

Additional requirement 0
- Upper-division writing skills by examination

Electives
- Additional courses supplementary to the major are optional. Additional coursework beyond the degree is recommended by Foundation for Interior Design Education Research (FIDER): Const 10, 32, 120, 142; GID 173, 179; OH 2; Art 116

Total requirements (including 40 upper-division units) 124

Advising Notes:

1. All courses required for the major must receive a letter grade, including additional major requirements in General Education.
2. Student work may be retained for a limited period for display and accreditation visits.
3. The upper-division writing skills requirement can be met by passing the university examination or by completing a W course with a letter grade of *C* or higher, after 56 units are completed.
4. The General Education requirement of 51 units may be exceeded depending upon the selection of courses.

Bachelor of Science Degree Requirements

Industrial Technology Major

Manufacturing Industries Option

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  - Category 3: Math 72 or 75 (required)
- BREADTH
  - Division 1: Physics 2A and 2B (required)
  - Division 8: Econ 40, 50, or Ag Ec 1 (required)
- CAPSTONE
  - Energy and Society Cluster (recommended): I T 106 and Econ 117

Major (including 18 upper-division units) 74
- Manufacturing Core ..... (37)
  - I T 74, 92, 102, 104, 107, 114, 115, 117, 118, 199; Acct 3; Mgt 104, 106
- Technical Specialty (select one) ..... (37)
  - Computer-Aided Design
    - I T 44, 119, 140, 144, 147, 148, 149, 192; C Sci 10, 15, 20; IS 165; plus 5 units approved by your adviser
  - Computer-Aided Process Planning
    - I T 119, 134, 135, 140, 144, 148, 149, 177, 192; C Sci 10, 15
    - Select 9 units from I T 30, 71, 170, 173, 174, 184
  - Electronic Communication
    - I T 119, 131, 132, 148, 153, 157, 158, 192; C Sci 10, 15, 20; IS 109, 165; plus 2 units approved by your adviser
  - Graphic Communications
    - I T 60, 160, 161, 162; GID 142, 165; C Sci 10; plus 18 units approved by your adviser
  - Industrial Control Electronics
    - I T 110, 112, 131, 132, 133, 153, 154, 156, 159; Const 164; C Sci 10; plus 6 units approved by your adviser
  - Manufacturing Automation
    - I T 119, 131, 132, 134, 148, 156, 159, 177, 192; C Sci 10, 15, 20; IS 165; plus 2 units approved by your adviser
  - Materials Processing
    - I T 30, 70, 71, 82, 112, 134, 170, 177, 184; C Sci 10, 15, 20; plus 3 units approved by your adviser
  - Transportation Systems
    - I T 12, 53, 110, 112, 120, 121, 122, 125, 129, 131; C Sci 10; plus 6 units approved by your adviser

Additional requirement 3
- Upper-division writing skills: I T 198W (required)

Electives 0

Total requirements (including 40 upper-division units) 128

Advising Notes:

1. All courses (except I T 192 and 194) required for the major must receive a letter grade, including additional major requirements in General Education.
2. Students must complete I T 198W with a grade of *C* or higher (after the completion of 56 units) to fulfill the upper-division writing requirement since this course is a prerequisite to I T 199, Senior Problem in Industrial Technology.
3. I T 41 and 52, which are prerequisites to some core and technical specialties in Industrial Technology, may be

waived if equivalent work experience and/or training is demonstrated.
4. The General Education requirement of 51 units may be exceeded depending upon the selection of courses.
5. Students must take two science courses in Division 1 to meet NAIT accreditation.

Industrial Technology Major

Construction Option

	Units
General Education (including 9 upper-division units, after completing 56 units of coursework)	51
CORE	
Category 3: Math 72 or 75 (required)	
BREADTH	
Division 1: Physics 2A (required)	
Division 8: Econ 40, 50, or Ag Ec 1 (required)	
CAPSTONE (either cluster recommended)	
Energy and Society Cluster: I T 106 and Econ 117	
Pollution, Health and Society cluster: C E 170 and H S 170	
Major (including 18 units upper division)	74
Construction Core	(59)
Const 5, 10, 42, 50, 105, 107, 114, 116, 120, 122, 124,142,162,164; I T 102; Acct 3; Mgt 104, 106; S E 11 or AET 91; C E 127	
Technical Specialty (select one)	(15)
Construction Management: Const 144, 150, 151, 166; Fin 180	
Architecture: Const 31, 32, 131, 132, 134	
Additional requirement	1–3
Upper-division writing skills (by examination or I T 198W)	
Approved Major Electives	0–2
Total requirements (including 40 upper-division units)	128

Advising Notes:

1. All courses required for the major must receive a letter grade, including additional major requirements in General Education.
2. The upper-division writing skills requirement can be met by passing the university examination or by completing I T 198W with a letter grade of *C* or higher only after 56 units are completed.
3. I T 41 and 52, which are prerequisites to some core and technical specialties in Industrial Technology, may be waived if equivalent work experience and/or training is demonstrated.
4. The General Education requirement of 51 units may be exceeded depending upon the selection of courses.

Other construction specialties may be developed under department advisement.

Minor

A minor in industrial arts consists of 20 units of which 9 must be upper division. At least 12 units must be taken in one of the following specific areas of concentration: architecture, computer-aided design, computer-aided process planning, construction management, electronic communications, graphic communications, industrial control electronics, manufacturing automation, materials processing, transportation systems.

Master of Arts Degree Requirements

The Master of Arts in Industrial Arts is a 30-unit program which offers graduate study in both industrial and educational related professional and technical fields. Emphasis is directed toward the attainment of advanced competency in the respective areas of industrial arts, manufacturing technology and construction. Through selected courses, within the department and other disciplines, knowledge and experience may be acquired in research and development, management and administration, technological studies, and educational studies that are related to all areas of the field.

For further information, see *Division of Graduate Studies and Research* in this catalog.

Admission Requirements. The Master of Arts degree program in Industrial Arts assumes preparation equivalent to a CSU, Fresno undergraduate major in industrial arts or industrial technology. Students who have not completed a degree in industrial arts or industrial technology are expected to have completed the following courses or their equivalents prior to enrollment in courses to be applied to the masters program: I T 12, 41, 52, 60, 74, 80, 102, plus 8–9 units in each of two areas of concentration.

Writing Skills Requirement. A student enrolled in the Master of Arts in Industrial Arts program meets the university writing skills requirement for graduate work by earning a minimum of 450 verbal on the Graduate Record Examination (GRE). If a minimum of 450 verbal on the GRE is not met, the student shall meet the requirement by then earning a score of 80 or higher on the Writing Competency Examination or by earning a *B* or better in a designated *W* course to be specified by the graduate committee of the school.

Full Classified Standing. A baccalaureate degree is required and an undergraduate major in industrial arts (I.A.) or in industrial technology (I.T.) or in a related area; 2.75 GPA (last 60 semester units); a 450V/430Q GRE score or a 400V minimum with a 880 total score; three letters of recommendation; completing departmental admission forms; and having a preadmission consultation session with the department graduate coordinator.

Applicants whose preparatory education was principally in a language other than English must earn a minimum TOEFL score of 550.

Advancement to candidacy requires completing 9 units of work toward the degree, satisfying the writing skills requirement, passing the Departmental Qualifying Examination and filing a Petition for Advancement to Candidacy with the SAST.

Program Requirements. Under the direction of a graduate adviser each student prepares and submits a coherent program individually designed within the following framework:

Specific requirements	Units
Industrial arts: I T 223, 280, 286; and other specified 200-series courses determined after examination of the student's record and performance on the departmental qualifying examination	16–18
Other subject fields: A S 153 or equivalent; approved elective appropriate to individually-designed program	4–6
Electives in industrial technology or related fields: Approved electives appropriate to individually-designed program	4–6
Culminating Experience: I T 298 or 299	2–4
Total minimum requirements	30

Prospective students should request the program advising sheet from the department. Upon admission students should see the graduate coordinator for aid in program planning, selection of a graduate adviser and selection of a thesis or project committee.

COURSES

Note: Expense to students in courses with variable fees depends upon the specific projects selected by the student. Student should consult with the course instructor.

Industrial Technology (I T)

12. Basic Automotive Systems (3). Design, construction and mechanical functions of automotive engines, fuel systems, electrical systems, power transmission, brakes, and wheel suspension; proper use and safety of tools and equipment. (2 lecture; 3 lab hours) (Former I Ed 12)

30. Plastics Technology (3). Introduction to the plastics field. Technical information on composition, characteristics and uses of plastics; equipment design principles and manufacturing processes. (Course fee variable; not less than $3.50) (6 lab hours; field trips) (Former I Ed 30)

41. Industrial Design Graphics (3). Application of the fundamentals of industrial design graphics. Sketching, lettering, orthographic projection, working drawings, auxiliary views, dimensioning, developments, pictorial drawings, duplication; interrelationship to the design process. (6 lab hours) (Former I Ed 41)

44. Descriptive Geometry (3). Prerequisite: I T 41 or permission of instructor. Descriptive geometry as related to design processes. A nonmathematical approach to geometric magnitudes and the relationship between points, lines and planes in space. Application of these principles in solving a variety of technological design problems (6 lab hours) (Former Const 44)

52. Basic Electricity (3). Introduction to electricity including fundamentals of electrostatics, alternating and direct current electrical circuits, electrical calculations, magnetics, circuit applications, electrical measuring and test equipment. (Course fee variable; not less than $3) (2 lecture, 3 lab hours) (Former I Ed 52)

53. Electronic Devices and Circuits (3). Prerequisite: I T 52. Characteristics and applications of electronic devices in analog and digital circuits including power supplies, amplifiers, oscillators, and switching circuits; introduction to linear integrated circuits. (Course fee variable; not less than $3.50) (6 lab hours)

60. Basic Graphic Arts (3). Introduction to the graphic arts; letterpress, photo offset lithography, screen printing; layout, composition, imposition, presswork, bindery. (Course fee, $6) (6 lab hours; field trips) (Former I Ed 60)

70. Basic Metalworking (3). Introduction to and exploration in various areas including sheet metal, bench metal, art metal, wrought iron, foundry and forging. (Course fee, $6.50) (6 lab hours) (Former I Ed 70)

71. Metallurgical Processes (3). Fundamentals of metallurgy; properties and characteristics of metals; survey of metal welding processes, equipment, and procedures; theory-discussion and laboratory experience in oxygen-fuel welding, cutting, brazing and shielded metallic arc welding. (6 lab hours) (Course fee variable) (Former I Ed 71)

74. Manufacturing Processes (3). Material removal by turning and milling operations on aluminum, brass, steel, plastic and wood. Material fusing and severing operations on metals and plastics. Non-ferrous metal casting and thin gauge metal and plastic forming operations. (Minimum course fee, $7) (6 lab hours) (Former I Ed 74)

80. Basic Woodworking (3). Basic woodworking and finishing process and materials; use and care of hand tools, portable electric tools, light woodworking machinery, basic units in wood technology. (Course fee variable; not less than $10) (6 lab hours) (Former I Ed 80)

82. Wood Machining (3). Prerequisite: I T 80. Development of proficiency in the operation and maintenance of modern woodworking machinery and spray finishing equipment; safety education, cutting principles and techniques, machine design and capabilities. (Course fee variable; not less than $10) (6 lab hours)

92. Industrial Safety Management (2). Principles of safety management in an industrial environment; safety legislation and programs; management/supervisory and employee responsibilities and attitudes; physical hazards associated with chemicals, equipment, fire, compressed gases; other topics include eye, stress, drugs, lifting, office and noise safety. (Former I Ed 92)

102. Industrial Data Processing Concepts (3). Computer fundamentals; flowcharting and programming techniques; industrial and technical programming systems and support components; data base organization and systems management; and industrial and technical management. (Field trips)

104. Materials of Product Design (3). Prerequisite: I T 41. Origins, kinds, properties and uses of materials of product design and development in modern industry; mechanical and nonmechanical functions of materials; experimentation with industrial materials of significance in the design of industrial products. (Course fee variable; not less than $3.50) (6 lab hours)

106. Energy Conversion and Utilization (3). Fundamental sources of energy, including the following energy conversion systems: direct mechanical, external combustion, internal combustion, solar power, wind power, electrical and atomic systems. Experiments and demonstrations. General Education CAPSTONE Cluster. (2 lecture, 2 lab hours; field trips)

107. Facilities Planning (3). Facility planning techniques as applied to facility location, zoning, building codes, line balancing, shipping-receiving, offices, material handling, storage, project scheduling and computerized layout.

110. Fluid Power (3). Prerequisite: I T 52. Selective study of fluid power principles and applications; hydraulics, pneumatics and vacuum; includes pumps, controls, transmission systems, actuators and fluidics. In-depth study of air conditioning-heating theory and applications. (Course fee variable; not less than $5) (6 lab hours; field trips)

112. Industrial Process Control and Instrumentation (3). Prerequisite: I T 52. Industrial process control system principles and components; computers, controllers, transducers, and actuators; mechanical and electrical instrumentation. (6 lab hours)

114. Industrial Materials (3). Chemical and physical properties of metals, polymers, ceramics, composites. Atomic structure and phases of matter emphasizing crystalline and amorphous solids. Mechanical properties, strength and testing of materials including impact, hardness and tensile. Metallographic, microscopic inspection of electronic and metallic specimens. (6 lab hours)

115. CAD Principles and Methods (3). Prerequisite: I T 41 or Const 42; I T 102. Computer-aided design applications. Special emphasis in manufacturing, construction and interior design applications. Exposure to CAD software packages.

117. Quality Assurance (3). Prerequisite: I T 102, Mgt 104, 106. Quality assurance principles and practices in industry: quality assurance systems, acceptance sampling, testing, source surveillance; probability and statistical concepts, process control techniques and measurement procedures as applied to quality.

118. Production Operations (3). Prerequisite: I T 102, 104; Mgt 104, 106. A survey of production manufacturing operations: quality assurance, work sampling, testing, time and motion study; routing, scheduling and inventory control; flow processes, material handling, and automation. (Field trips)

119. Computer-Integrated Manufacturing Concepts (3). Prerequisite: a computer programming language; I T 118 or equivalent. Strategies on how to implement Computer-Integrated Manufacturing (CIM) for a complete manufacturing enterprise. Focuses on CIM systems, opportunities, concerns and solutions; design, development, implementation, and operations; and employees' educational programs. Team efforts and management are emphasized. (Former I T 105)

120. Automotive Engine Systems (3). Prerequisite: I T 12, 53 or concurrent enrollment. Advanced study of automotive engines and support systems. Includes engine theory, fuel and electrical systems, turbochargers, LPG, diesel, computerized emission and engine controls and dynomometer testing analysis. (6 lab hours; field trips)

121. Automotive Engine Machining (3). Prerequisite: I T 12, 74. Advanced study of automotive engine machining including precision measurements, principles of engine operation, machining of engine components, crack detection, assembly procedures, lubricating and cooling systems. (Course fee, $6) (6 lab hours; field trips)

122. Automotive Chassis Analysis (3). Prerequisite: I T 12. Advanced study of automotive chassis components including power transmission, brake systems, wheel suspension, air conditioning, lubricants theory and testing, body repair and refinishing. (6 lab hours; field trips)

125. Multifuel Engine Power Analysis (3). Prerequisite: I T 12. Laboratory and computerized dynamometer study in the testing of new fuels or combinations of fuels, alternative engine design, emissions analysis and dissemination of research data. (2 lecture, 3 lab hours; field trips) (Former I T 191T section)

129. Automotive Diagnostic Procedures (3). Prerequisite: I T 12, 53 or concurrent enrollment. Laboratory study and analysis of mechanical, electrical and computer control problems. Technical reports. (6 lab hours)

131. Digital Circuits and Systems (3). Prerequisite: I T 52. Number systems, Boolean logic, and fundamentals of digital devices; basic applications of logic devices in computers and control systems. (2 lecture, 3 lab hours; field trips)

132. Microprocessor Applications (3). Prerequisite: I T 131, 131L. Microprocessor characteristics and programming; application and interface to digital and analog control and communication circuits; introduction to microcomputer hardware. (2 lecture, 3 lab hours)

133. Programmable Logic Controllers (2). Prerequisite: I T 131, 131L; I T 112 recommended. Programmable logic controller principles and equipment; programming languages, procedures, and documentation; equipment and software selection and application.

134. Programmable Automation (3). Prerequisite: I T 177 or a high level programming language. Study, analysis and evaluation of programmable industrial systems. APT programming language for numerical control and application languages for robots, programmable logic controllers, process controllers and microcomputers. Applications of these systems in flexible manufacturing cells. (2 lecture, 2 lab hours)

135. Computer-Aided Process Planning (3). Prerequisite: I T 115, 177. Applications of computers to process planning, group technology; tool and fixture design; and route sheet preparation.

140. Principles of Applied Technology (3). Prerequisite: Math 72 or 75; Phys 2A–B. Problem solving and analysis using physical science principles of mechanics, thermodynamics and hydraulics.

141. Machine Design Graphics (3). Prerequisite: I T 41. Advanced technical drawing and design. Use of dimensioning/tolerancing, fabrication and materials standards, handbooks and industrial catalogs. Application of various machining and forming operations, including computer-aided design, in the investigation and completion of design problems. (6 lab hours; field trips)

144. Tool Design Graphics (3). Prerequisite: I T 41, 44, 115. Application of graphics to industrial work holding devices; their application, drawing and design. Construction of working drawings aided by standards, company catalogs, and handbooks. Final designs subjected to student presentation and evaluation. (6 lab hours; field trips)

147. Advanced CAD Applications (3). Prerequisite: I T 115, 140, 144. CAD as a tool to facilitate design activities. An overview of design processes and methods. Solid modeling techniques are introduced. A team approach in system design is emphasized.

148. CIM Systems Analysis and Development (3). Prerequisite: I T 115, 119, 147. Computer-Integrated Manufacturing (CIM) systems utilized in manufacturing industries, systems development cycle, systems analysis, justification, benchmarking, personnel and facilities planning.

149. CIM Systems Management (3). Prerequisite: I T 115, 119, 147, 148. Computer-Integrated Manufacturing (CIM) system data base philosophies. System administration, facility organization and administration, personnel development and organization, training, system maintenance and evaluation.

153. Fundamentals of Electronic Communication Systems (3). Prerequisite: I T 53. Electronic systems and applications including basic transmitters, amplitude and frequency modulation transmitters and receivers; transistor applications; antennas; television. (6 lab hours; field trips)

154. Electric Power Generation and Distribution (3). Prerequisite: I T 52. Electrical power generation and distribution systems. Power circuits, substations, switching, single and polyphase transformers, and industrial/commercial electric demands are emphasized. (6 lab hours; field trips)

156. Electric Motors and Controls (3). Prerequisite: I T 52. Study and analysis of the characteristics and industrial applications of electric motors. Major emphasis is placed on programmable, solid state and electromechanical motor controllers. (Course fee variable; not less than $4) (6 lab hours; field trips)

157. Fundamentals of Telecommunications (3). Prerequisite: I T 153. Introduction to telecommunications. Electromagnetic wave theory, propagation and spectrum. Transmission, switching and imperfections. Telecommunication systems. (6 lab hours; field trips)

158. Local Area Network Fundamentals (3). Data communication problems, concepts, protocols, specifications; Local Area Network (LAN), Manufacturing Automation Protocols (MAP). Technical and Office Protocol (TOP), computer integration; MAP specification, implementation and testing.

159. Industrial Electronics (3). Prerequisite: I T 53, 112 and 153 or 119 and 132; 154, 156 recommended. Industrial electronics systems analysis; applications of analog and digital electronic circuits, devices and systems to industrial process and machine control. (Course fee variable) (6 lab hours)

160. Graphic Communication Developments (3). Prerequisite: I T 60. An investigation of the graphic reproduction processes including laboratory experiences, practical application, and frequent industrial trade tours. In-depth study of individually selected topics resulting in written and oral research reports. (Maximum materials fee $10.00) (6 lab hours; field trips)

161. Photo Offset Lithography (3). Prerequisite: I T 60. Photo offset lithography techniques and processes: design, layout, cold type composition, and paste-up, line, and half-tone copy, imposition, multicolor printing. (Course fee, $15) (6 lab hours; field trips) (Former Ind A 161)

162. Graphic Arts Crafts (3). Various processes and media used in graphic arts; creative and recreational aspects for the student; silk screen, linoleum block, intaglio, papermaking, thermographs, marbling, bookbinding, student projects. (Course fee, $6.35) (6 lab hours; field trips) (Former I Ed 162)

170. Advanced Principles of Metalworking (3; max. total 6). Prerequisite: I T 70. Study and experience in the technological, scientific, and historical aspects of nonferrous metal casting, core-making; forging, principles of metal spinning. (Course fee, $6.50) (6 lab hours)

173. Metal Fabrication Processes (3). Sheet metal pattern drafting and layout applicable to parallel, radial, and triangulation methods using light gauge metals; individual problems in planning, using, and maintaining hand and machine tools. (Course fee, $6.50) (6 lab hours)

174. Advanced Machine Tool Metalworking (3). Prerequisite: I T 74. Advanced machining and tooling, special machine tools, and precision measuring instruments; laboratory experiences in use of ferrous and nonferrous metals, cast iron and semisteel castings; coolants related to modern manufacturing process. (Course fee variable; not less than $2.50) (6 lab hours)

175. Machine Tool Technical Problems (3). Prerequisite: I T 174. Advanced technical work in metals, layout, fabrication, heat treatment and machinability; specifications of materials; introduction to gearing principles, tool and die work, jigs, and fixtures. Experimental projects and technical reports. (Course fee variable; not less than $3.75) (6 lab hours)

177. Computer Numerical Control (3). Prerequisite: I T 74, 102, 178. Introduction to computer numerically-controlled hardware including milling and turning centers and flexible manufacturing systems. Programming in languages common to computer numerically controlled machine tools. Computer-controlled machining of industrial materials including aluminum, brass, steel, plastic, expanded foam and wax. (Minimum course fee, $5) (6 lab hours)

178. Numerical Control Programming in APT-4 (3). Prerequisite: I T 102. Introduction to a high-level programming language, APT-4. Structural programming techniques including branching, looping, subroutines, tracut, copy, indexing and macros. Computer organization and architecture using computer-to-computer communications and file transfer; use of CSU network resources.

182. Woodworking Specialties (3; max total 6). Prerequisite: I T 82. Specialized activities related to the field of woodworking: upholstering, inlaying and veneering, advanced wood turning, plastic laminate fabrication, bending and laminating, molded plastic parts, paneling, caning, glass and mirrors, picture framing, furniture restoration, wood finishing. (Course fee variable; not less than $10) (6 lab hours)

184. Wood Technology (3). Prerequisite: I T 82. Wood structure, identification, physical testing; study of wood products and processing industries. (Course fee variable; not less than $2) (6 lab hours; field trips)

185. Advanced Wood Machining (3). Prerequisite: I T 82. Design, construction, and finishing of furniture, cabinet work, millwork. Production methods, analysis of cutting processes. (Course fee variable; not less than $10) (6 lab hours)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading. (Course fee variable)

191T. Technical Topics in Industrial Technology (1–3; max total 6). Prerequisite: permission of instructor. Investigation and analysis of selected subjects in industrial technology. (2–6 lab hours)

192. Manufacturing Technologist Certification Review (1). Prerequisite: junior standing. Preparation for Engineer-in-Training Examination in Manufacturing by the Society of Manufacturing Engineers. Basic mathematics, physics statics, and strength of materials. Materials science and metallurgy. Engineering drawings and blueprint reading; metrics and the SI system. *CR/NC* grading only. (Former I T 191T section)

194. Cooperative Education in Industrial Technology (1–4; max. total 12). Prerequisite: courses appropriate to the work experience; permission of department cooperative education coordinator; junior standing. Integration of work experience with academic program, individually planned through program adviser. *CR/NC* grading only.

195. Modern Industrial Facilities (1–2; max total 4). Observation, analysis, and critique of production methods and facilities of selected industries of interest to Industrial Technology and/or Industrial Arts majors within options, emphases, or unit areas of study. (Course fee variable)

198W. Technical Writing (3). Prerequisite: Engl 1; completion of 56 units. Preparation of technical reports, research proposals, specifications, resumes and correspondence using effective writing techniques, formats and styles. Meets upper-division writing skill requirement for graduation. (Former I T 198)

199. Senior Problem in Industrial Technology (2). Prerequisite: I T 198W and permission of instructor. Approved problem or research project in the area of the student's option and emphasis. Approved for *SP* grading.

Construction Management (Const)

5. Construction Materials (3). Introduction to basic construction materials: concrete, masonry, metals, woods, thermal materials, finishes, equipment and specialties. (2 lecture, 2 lab hours, field trips)

10. Estimating and Bidding (3). Prerequisite: Const 5, 42. Basic methods used to evaluate, fix cost, calculate worth, make accurate quantity take-offs and labor time estimates; preparing bids for prospective buyers. (6 lab hours)

31. Architectural Graphics (3). Introduction to basic techniques and media used in architectural graphic communication including: perspective techniques, sciagraphy, models and photography; emphasis on various ways of making drawn representations of architectural design proposals. (6 lab hours)

32. Architectural Design (3). Introduction to architectural design theory; analysis of architectural design problems, assessment of human needs, establishment of architectural design criteria and development of architectural design concept. (6 lab hours)

42. Architectural Drawing (3). Architectural drafting techniques and standards; progress from fundamentals to completion of light construction working drawings, floor plans, elevations, details, application of building codes. (Course fee, $5) (6 lab hours)

50. Basic Building Systems (3). Exploration of theoretic principles relating to the various building systems. (2 lecture, 2 lab hours; field trips)

105. Construction Structures (3). Prerequisite: Const 5; Phys 2A; Math 5 (recommended). Properties, strength and functional applications of basic construction materials: woods, metals and concrete. Recent developments in new materials and applications. (2 lecture, 2 lab hours; field trips)

107. Advanced Construction Structures (3). Prerequisite: Const 105. Analysis of construction materials in its application to different structural systems. (Former Const 191T section)

114. Construction Management (3). Prerequisite: senior standing in Construction. The construction manager's relation to internal organization, owner, architect, engineer, public, press, legal aid, unions, trades, equipment, utilities, insurance, finances, government and others.

116. Scheduling and Control (3). Prerequisite: I T 102 recommended; senior standing. Critical path method; planning, scheduling, and control of construction projects including logic, time assignment and computation, analysis, replanning, diagramming practices, monitoring and updating, computer utilization; role of management. (6 lab hours)

120. Construction Contracts and Specifications (3). Prerequisite: Const 42. Principles and methods for developing and applying construction contracts and specifications.

122. Construction Laws (3). Laws, acts, orders, bulletins, rules and regulations affecting the construction industry.

124. Construction Labor Law (3). Prerequisite: Const 122. Study of federal and state labor-oriented regulations as applied to construction industry practices. Interaction between technical and legal aspects of collective bargaining, pre-hire agreements, hiring hall referrals, open shop construction, work force management, labor standards, employment discrimination, strikes and picketing.

131. Advanced Architectural Graphics (3). Prerequisite: Const 31. Architectural graphic techniques as tools of three dimensional analysis and representation in the design process. (6 lab hours)

132. Advanced Architectural Design (3). Prerequisite: Const 32. Development of understanding of the forces affecting the manmade environment through function identification, systems analysis, and development of architectural design solutions to problems at an intermediate level of complexity. (6 lab hours)

134. Architectural Design Problems (3). Prerequisite: Const 132 or permission of instructor. Conceptual planning and design of a large scale architectural project responding to the social and



cultural context of the environment. Employing team research and analysis leading to the design and presentation on individual solutions with graphic and three-dimensional techniques. (6 lab hours)

142. Computer-Aided Construction Detailing (3). Prerequisite: Const 42. Application of computers to planning and details for wood, concrete, masonry and steel structures. (6 lab hours; field trips)

144. Construction Site Planning and Development (3). Prerequisite: Const 142. Analysis of land development; site investigation, grading, street piping systems and landscaping. (6 lab hours)

150. Heavy Construction (3). Prerequisite: Const 105, 116, 120, senior standing. Problems and methods of solution in heavy construction from earth moving, paving, compacting to tunneling; administrative procedures, quantity surveying, estimating, scheduling and bidding. (2 lecture, 2 lab hours; field trips)

151. Heavy Building Construction (3). Prerequisite: Const 150. Problems and methods of solutions in the construction of heavy buildings; site, excavations, foundations, framework, heavy timber, reinforced concrete, structural steel, masonry construction and related elements. (2 lecture, 2 lab hours; Field trips)

162. Mechanical Systems in Construction (3). Heating, ventilating and air conditioning systems in buildings and plants; plumbing systems, California Energy Code, heat loss and gain, system sizing and life cycle cost analysis. Lectures, demonstrations, guest speakers from industry. (Field trips)

164. Building Electrical Systems (3). Prerequisite: I T 52. Electrical systems for power, light, heat, signals, and communications in commercial, industrial and residential buildings. (Course fee, $7) (6 lab hours; field trips)

166. Solar Energy in Building (3). Prerequisite: Const 162. The practical application of solar energy for hot water and passive heating of buildings. Coverage will include performance calculations, manually and by computer, life cycle cost calculations, systems sizing, determination of available solar energy and solar materials and components. (Former Const 160)

190. Independent Study (1–3; max see reference) See *Academic Placement — Independent Study.* Approved for *SP* grading. (Course fee variable)

191T. Technical Topics in Construction (1–3; max total 6). Prerequisite: permission of instructor, investigation and analysis of selected subjects in construction. (2–6 lab hours)

193. Supervised Work Experience (3–6; max total 6). Open only to Industrial Arts and Industrial Technology majors. Prerequisite: junior standing and permission of instructor. Supervised work experience in all technological fields relating to the various industries. Periodic consultations with instructor. *CR/NC* grading only.

Graphic and Interior Design (GID)

43. Visualization and Illustration (3). Not open to students with credit in I Ed 141 or GID 141. Rapid visualization as a means of quick visual communication for the illustrator or designer. Illustration techniques include projects in pencil, pen, markers, shading and opaque water color. (6 lab hours)

70. Interior Design Foundations (3). Prerequisite: recommend GID 71 concurrently. Social, psychological, economic and aesthetic aspects of interior design. Integration of design principles; space planning, furniture selection, creative expression and consumer information pertaining to living space. (Former IDH 70)

71. Residential Interior Design (3) Prerequisite: GID 70 (or concurrently); Const 42. Introductory residential experience in interior design. Studio work, creative aesthetics, floor plans, elevations, electrical plans, spatial arrangements, graphics, two dimensional design, introduction to ink, lettering, set of working drawings. (Course fee, $5) (6 lab hours) (Former IDH 71)

72. Interior Design Presentation (3). Prerequisite: GID 70. Introductory experiences in creative design presentation and technique, architectural graphics, product presentation boards, three dimensional model design problems and use of color media. (Course fee, $5) (6 lab hours) (Former IDH 72)

107. Applied Color and Design (3). Introduction to the application of color and design; properties of color, simple graphic methods and three dimensional design. Studio work and critiques. (6 lab hours) (Former IDH 107)

117. Space Planning (3). Prerequisite: GID 71, Const 42. Introduction to interior space planning for typical residential and commercial projects. Design considerations, human dimensions, anthropometrics. Elderly, physically disabled and basic design reference standards. Design for special populations. (Course fee, $5) (6 lab hours) (Former IDH 172T section)

142. Advertising Design (3). Prerequisite: I T 60. Advertising and illustration problems from rough sketches to finished art work. Emphasis on good design and professional techniques. Preparation of art work for reproduction including overlays, art type, photo mechanical procedures and advertising production methods. (Course fee, $2) (6 lab hours) (Former I Ed 142)

143. Rendering (3). Prerequisite: GID 141. Exploration of a variety of illustration techniques as they apply to interior design, commercial art, and advertising. Emphasis on professional application and quality. Black and white and full color techniques. (Course fee, $5) (6 lab hours) (Former I Ed 143)

144. Perspective Drawing (3). Prerequisite: GID 141 recommended. Theory of one-, two- and three-point perspective, followed by extensive application. Laws of perspective and light and shade as applied to increasingly complex subject matter. (6 lab hours) (Former I Ed 144)

146. Advanced Rendering (3; max total 6). Prerequisite: GID 143. Advanced rendering for industrial design, architecture, interior design, commercial art and illustration. Includes limited and full color problems with emphasis on professional presentation. Individual exploration encouraged. (6 lab hours) (Former I Ed 146)

147. Advertising Illustration (3). Prerequisite: GID 141. Illustration as it applies to advertising situations. Composition and techniques designed for quick reading and ease of execution. Black and white, and limited color. (Course fee, $5) (6 lab hours) (Former I Ed 147)

148. Advanced Advertising Design (3; max total 6). Prerequisite: GID 142. Advanced advertising/graphic design from conceptual to finished art. Includes problems and more advanced approaches relating to various media such as logo design, billboards, T.V., etc. Emphasis on production procedures, professionalism and building a strong portfolio, including critiques. (6 lab hours) (Former I Ed 148)

165. Typography (3). Prerequisite: I T 60. Typographic principles, elements, and technique: type classification and selection, copyfitting, design and layout. Modern composition; computerized phototypesetting systems. Paste-up techniques. (Course fee, $4) (6 lab hours; field trips) (Former IT 165)

170. Commercial Interior Design (3). Prerequisite: GID 70, 71, 72, 117; Const 42. Introduction to the application of contemporary designs and office systems as related to the field of light commercial interiors. (6 lab hours) (Former IDH 170)

172T. Topics in Graphic and Interior Design (1–4; max total 12 if no topic repeated). Prerequisite: GID 70, 72. Topics related to graphic and interior design. Some topics may have labs. (Former IDH 172T)

173. Interior Design Tours (3). A sampling of architecture and interior space. Tours include northern, central and southern California architecture. Residential and contract showrooms visited. Expenses for required off-campus visits incurred by the student. (Course fee, $150) (6 lecture-lab hours) (Former IDH 173)

174. Contemporary Architecture and Interiors (3). Emergence of contemporary architecture and interiors, forces, architects and designers responsible for 20th century designs. Emphasis on change in form, style, materials and client demand. (Former IDH 174)

175A. History of Architecture and Interiors: Ancient World to Baroque Period (3). Prerequisite: course in art history recommended. A stylistic survey of characteristics common to each historical period of architectural and furniture design. (Former IDH 175A)

175B. History of Architecture and Interiors: Baroque to Modern (3). Prerequisite: course in art history recommended. A stylistic survey of characteristics common to each historical and modern period of architectural and furniture design. (Former IDH 175B)

176. Interior Design Materials and Specifications (3). Prerequisite: GID 70; FM 20. Selection, specifications and computations of interior design materials available for the residential and commercial market. Consumer and specifier considerations; application, distribution, installation, and evaluation. Lecture, small group research and field trips. (Course fee, $10) (2 lecture, 2 lab hours) (Former IDH 176)

177. Professional Interior Design Practices (3). Prerequisite: GID 70, 176; Acct 3. Basic principles, procedures and office systems necessary to professionally organize and carry through a creative interior design project from the original client contact to final billing and collecting. (1 lecture, 4 lab hours) (Former IDH 177)

178A. Advanced Residential Interior Design (3). Prerequisite: GID 144, 170, 175A–B, 176; I T 115. A series of advanced creative design solutions for residential environments. Design for new construction, remodeling and restoration for a variety of life styles, budgets and physical conditions. Working drawings presentation techniques and specifications. (Course fee, $5) (6 lab hours) (Former IDH 178A)

178B. Advanced Commercial Interior Design (3). Prerequisite: GID 144, 170, 175A–B, 176; I T 115. A series of design solutions for a diversity of commercial spaces: public buildings, health care, food service, professional offices and merchandising facilities. Space planning, equipment lighting, systems, codes, layout, presentation and specifications. (6 lab hours) (Former IDH 178B)

179. Interior Design Exhibits and Competitions (3; max total 6). Prerequisite: GID 170; permission of instructor. Provides a structure for students to participate in creative design shows or manufacturer interior design competitions and exhibits. (6 lab hours). (Former IDH 179)

180. Restoration and Preservation (3). Prerequisite: GID 174, 175A–B, 176 and permission of instructor. Principles and methods of restoration, case studies of the restoration and preservation of historically significant structures in the United States. Working drawings, details and specifications. (2 lecture, 2 lab hours) (Former IDH 180)

181. Interior Design Practicum (1; max total 6). Prerequisite: senior standing; GID 176, 178A or 178B; permission of instructor. Supervised professional practice in interior design related business or industry. (Former IDH 181)

182. Interior Lighting (3). Prerequisite: GID 70. Introduction to lighting of residential and commercial interiors. Laboratory testing and lighting calculations. (2 lecture; 2 lab hours). (Former IDH 182)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading. (Course fee variable.) (Former IDH 190)

GRADUATE COURSES *(I T)*

(See *Course Numbering System.*)

The following graduate courses are open only to students who have been accepted into a graduate program. Students who are not in graduate standing should contact the department graduate coordinator prior to enrolling.

223. Technology and Society (3). Study of the developmental history of technology and its impact on people and their institutions. Topics focus on the consequences of rapid technological change as it relates to education and training, energy demands, and environmental concerns. (Former I Ed 223)

270. Technical Problems (2–3; max total 9 if no area repeated; max combined total with I T 290 is 12). Technical work in selected areas; research under supervision of instructor. Approved for *SP* grading. (Former I Ed 270)

280. Research Methodology (3). Prerequisite: A S 153 and advancement to candidacy. Seminar in research procedures in industrial education and technology; basic bibliography, research form and methods. (Former I Ed 280)

282. Advanced Communication Concepts and Visual Presentations (3). Prerequisite: I T 115. Preparation and use of agendas, memoranda, business letters, electronic mail, fax communications. Video development and slide and transparency preparation and the incorporation of these media into presentations. Interview techniques, resume evaluations, dictation skills, professional relations with personnel, business etiquette. (Former I Ed 284T section)

283. Advanced Materials and Processes (3). Prerequisite: I T 114. Chemical and physical properties of metals, polymers, ceramics and composites. The atomic structure and phases of matter emphasizing crystalline and amorphous solids. Materials technology of metallic, polymeric, ceramic, and advanced composites are stressed. (Former I Ed 284T section)

284T. Topics in Industrial Technology (2–3; max total 9 on master's degree if no area repeated). Advanced study in technical areas; current industrial practices, developments, and trends related to design, materials, and processes. (Former I Ed 284T)

285. Advanced Manufacturing Systems (3). Prerequisite: I T 74, 115. A comprehensive study of modern manufacturing systems. Topics include plant layout, material control and transfer, operations measurement, transfer lines, CNC and DNC, machine tool network, computer-integrated manufacturing, flexible manufacturing systems, group technology, robotics and manual assembly systems. (Former I Ed 284T section)

286. Safety and Related Problems in Industrial Education and Technology (3). Safety principles in occupational, industrial and school settings, safety legislation, inspections, equipment, workman's compensation, first aid, fire, noise and general safety. (Former I Ed 286)

290. Independent Study (1–3; max total 6 if no area repeated; max combined total with I T 270 is 12). See *Academic Placement — Independent Study.* Approved for *SP* grading. (Former I Ed 290)

298. Project (2–4; max total 4). Prerequisite: I T 280; prior advancement to candidacy. See *Criteria for Thesis and Project.* Completion of an approved project appropriate to the candidate's area of specialization involving the development of a physical prototype or other similar professional problem-solving activity with extensive written documentation. Abstract required. Approved for *SP* grading. (Former I Ed 298)

299. Thesis (2–4; max total 4). Prerequisite: I T 280; prior advancement to candidacy. See *Criteria for Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading. (Former I Ed 299)

IN-SERVICE COURSE *(I T)*

(See *Course Numbering System.*)

341. Problems in Industrial Arts (2–3; max total 6 if no area repeated). Prerequisite: permission of instructor. Intensive analysis of a selected area in industrial arts or industrial technology. Research paper, project or reports. (Former I Ed 341)

AGRICULTURE
Plant Science and Mechanized Agriculture

School of Agricultural Sciences and Technology
Department of Plant Science and Mechanized Agriculture
Gary L. Ritenour, Chair
Agriculture Building, Room 220
(209) 278-2861

B.S. in Plant Science
Options:
Crop Science (Agronomy and Vegetable Crops), Ornamental Horticulture, Plant Protection, Soils/Irrigation, Viticulture/Tree Fruit
Emphases: Production Management
Science and Technology

B.S. in Agricultural Science
Option I: Production
Concentration: Agricultural Engineering Technology
Programs of Study: Automation
Food Technology
Power and Machinery
Soil and Water

Minor in Plant Science
Minor in Agriculture
(Agricultural Engineering Technology)

M.S. in Plant Science
Options: Crop Science, Plant Protection, Soil Science/Irrigation

The Department of Plant Science and Mechanized Agriculture offers programs in production with classes in business management and in science and technology. Within the production or science emphases, students select an option in crop science (agronomy and vegetable crops), ornamental horticulture, plant protection, soils/irrigation or viticulture/tree fruit.

Additionally, the department offers an agricultural science degree with a concentration in agricultural engineering technology that includes classes in business management or science and technology. Courses offered by the department integrate physiology, soils and nutrition, cultural practice, protection against plant pests, marketing, storage and handling practices and mechanization to provide the student with a well-balanced background for positions in plant/soil sciences, crop production and agricultural engineering technology. In addition, courses in areas such as micropropagation, plant improvement and seed technology provide the student with a background for further studies in plant biotechnology.

Each degree option integrates departmental curricula with the basic sciences (e.g., biology, chemistry, mathematics, physics) and management skills to build a well-balanced foundation.

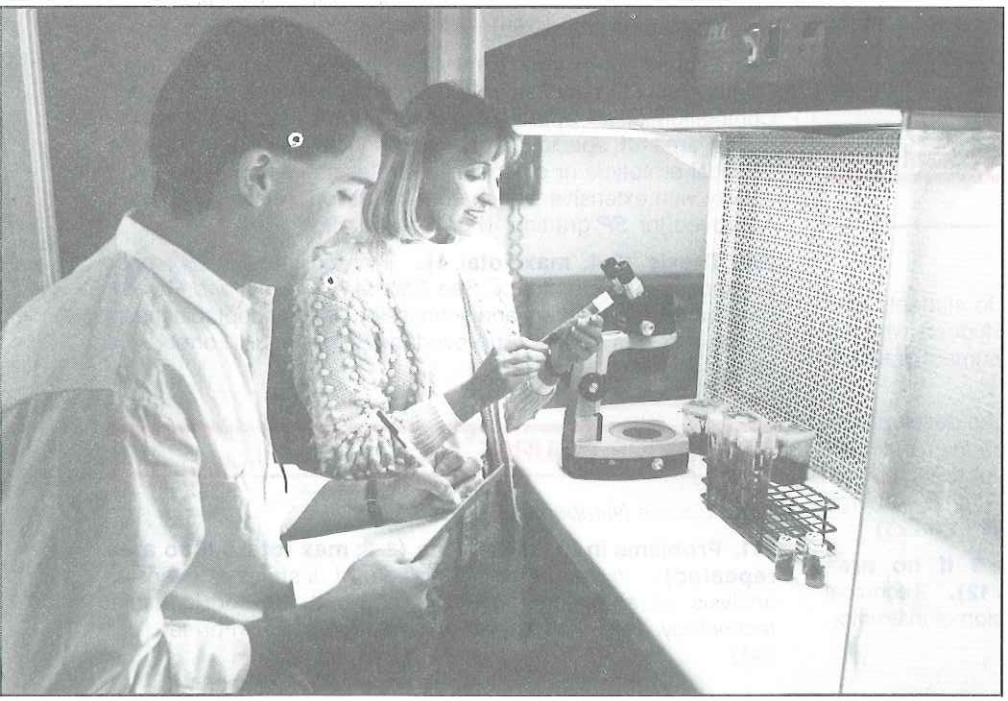
The irrigation and viticulture programs have received the Western Region and National Awards for Excellence in Agricultural Technology Instruction respectively. These prestigious awards are sponsored by the National Association of State Departments of Agriculture and the R. J. Reynolds Industries Inc.

Career Opportunities

The courses offered within each of the disciplinary areas in the department provide the required background and experience to qualify graduates of these programs for many exciting, well-paying careers. For a list of career opportunities, contact the department office.

Laboratory Units and Supervised Projects

See *School of Agricultural Sciences and Technology.*



Faculty

Gary L. Ritenour, *Chair*

Arthur J. Olney, *Graduate Coordinator*

Sayed A. Badr
Mahendra S. Bhangoo
Earl H. Bowerman
James R. Brownell
Bendt A. From
Allan A. Hewitt
Mahlon M. S. Hile
Harry P. Karle
Joo I. Kim
Gary M. Koch
Charles F. Krauter
Howard J. Martin
Mark A. Mayse
Arthur J. Olney
Vincent E. Petrucci
Gary L. Ritenour
Julian W. Whaley

The faculty hold advanced degrees in their respective fields of specialization from leading agricultural institutions and universities in the United States. They are well-qualified teachers who, through extensive research and interaction with major agricultural industries, bring a wealth of basic and practical information into the classroom.

A faculty academic adviser is assigned to work with each student to plan and design an individualized program of study to meet the student's educational and career objectives.

Most of the faculty are involved in one or more of the California Agricultural Technology Institute Centers — the San Joaquin Experimental Range, the Center for Irrigation Technology, and the Viticulture and Enology Research Center. The centers offer excellent opportunities to undergraduate and graduate students who gain experience by participating in applied research projects that address and help solve problems faced by California's agricultural industry.

Bachelor of Science Degree Requirements

Plant Science Major

Options: Crop Science, Ornamental Horticulture, Plant Protection, Soils/Irrigation, Viticulture/Tree Fruit

Production Management Emphasis

Recommended curriculum for students interested in Crop Science (Agronomy, Vegetable Crops), Ornamental Horticulture, Plant Protection, Soils/Irrigation or Viticulture/Tree Fruit, with emphasis on production, business management and marketing.

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  - Category 3: Plant 99 (recommended)
- BREADTH
  - Division 1: Chem 3A (required)
  - Division 2: Bot 10 (required)
  - Division 3: Plant 105 (recommended)
  - Division 4: CFS 38 or FScN 53 (recommended)
  - Division 8: Ag Ec 1 (recommended)
- CAPSTONE
  - Either cluster recommended:
  - Agriculture and Government Policy:
    - Ag Ec 150 and Pl Si 150 or Phil 125
  - Energy and Society:
    - I T 106 and P Sci 168 or Geog 134 or Econ 117

Major (including 20 upper-division units) 45
- Plant Science Core (required) ..... (16)
  - Pl Pr 103, 105, 106; Sl 2, 100, 100L
- Option ..... (29)
  - Plant 150 (required). Select 3 units from Plant 180, 190 and/or 196 (required). Select 23 units of departmental courses in consultation with adviser (15 units must be from **one** of the following option categories and 12 of those units must be upper division).
  - Crop Science — Agronomy and Vegetable Crops
  - Ornamental Horticulture
  - Plant Protection
  - Soils/Irrigation
  - Viticulture/Tree Fruit

Additional requirements 19–21
- Satisfy upper-division writing skills requirement by UDWE exam offered each semester or Plant 110W
- Chem 3B
- Management courses
  - Ag Ec 31, 110N, 117, 120 or 130, 164

Electives 11–13
- Courses supplementary to the major selected in consultation with your adviser.

Total requirements (including 40 upper-division units) 128

Advising Notes:

1. New students should request a program of study check sheet from the department.
2. Meet with your academic adviser prior to registration each semester.
3. General Education courses designated as required by the department are prerequisites to many courses in the program of study. The General Education requirement of 51 units may be exceeded depending upon your selection of courses.
4. *CR/NC* grading is not permitted for courses included in the major.
5. Upper-division courses (i.e., 100-level courses) may not be applied toward the 40 upper-division unit degree requirement until 45 lower-division units toward the degree have been completed.
6. The upper-division writing skills requirement can be met by passing the university Upper-Division Writing Examination (UDWE) or by taking an approved upper-division writing skills course. One unit of credit (i.e., English 100W) may be earned for passing the exam; 3 units of credit is earned by obtaining a letter grade of *C* or higher in an approved course (e.g., Plant 110W). In either case, the requirement will have been met.
7. One semester prior to graduation, contact your academic adviser to prepare and file an official Certification of Major Requirements form. Your Application for Graduation cannot be processed by the Evaluations Office until this form has been submitted.
8. Students interested in becoming Certified Professional Agronomists, Crop Scientists/Specialists or Soil Scientists/Specialists should consult with their department faculty adviser for additional requirements for certification.

Plant Science Major

Options: Crop Science, Ornamental Horticulture, Plant Protection, Soils/Irrigation, Viticulture/Tree Fruit

Science and Technology Emphasis

Recommended curriculum for students interested in pursuing a high technology career in Crop Science (Agronomy, Vegetable Crops), Ornamental Horticulture, Plant Protection, Soils/Irrigation or Viticulture/Tree Fruit. Also recommended for students planning to pursue graduate study in Plant Science and for those who wish to become Certified Professional Agronomists, Crop Scientists/Specialists, or Soil Scientists/Specialists.

	Units
General Education	51
CORE	
Category 3: Math 70 (required)	
BREADTH	
Division 1: Chem 3A (required)	
Division 2: Bot 10 (required)	
Division 3: Plant 105 (recommended)	
Division 4: CFS 38 or FScN 53 (recommended)	
Division 8: Ag Ec 1 (recommended)	
CAPSTONE	
Either cluster recommended:	
Agriculture and Government Policy: Ag Ec 150 and Pl Si 150 or Phil 125	
Energy and Society: I T 106 and P Sci 168 or Geog 134 or Econ 117	
Major (including 20 upper-division units)	45
Plant Science Core (required)	(16)
Pl Pr 103, 105, 106; SI 2, 100, 100L	
Career Option	(29)
Plant 99 (required)	
Select 3 units from Plant 180, 190, 196 (required)	
Select 23 units of departmental courses in consultation with adviser (12 units must be from one of the following option categories and 9 of those units must be upper division).	
Crop Science — Agronomy and Vegetable Crops	
Ornamental Horticulture	
Plant Protection	
Soils/Irrigation	
Viticulture/Tree Fruit	
Additional requirements	18–23
Satisfy upper-division writing skills requirement by UDWE exam offered each semester or Plant 110W	
Science courses	
Biol 120; Bot 104; Chem 8 and either 4 and 105, or 150; Micro 20	
Electives	9–14
Courses supplementary to the major selected in consultation with department faculty adviser are strongly recommended. Zool 10 recommended for Pl Pr emphasis.	
Total requirements (including 40 upper-division units)	128

Advising Notes:

See *Advising Notes,* Plant Science Major, Production Management Emphasis.

Plant Science Minor

Options: Crop Science, Ornamental Horticulture, Plant Protection, Soils/Irrigation, Viticulture/Tree Fruit

The 21 units of courses will constitute a basic background in plant science. The program is similar to the major core and provides students with an introduction to the broad spectrum of plant science. Other majors in the School of Agricultural Sciences and Technology, particularly the Agricultural Business and Education majors, require students to be knowledgeable of plant science in order to pursue their careers or teach the subjects of agricultural production. This minor would be a way in which students could acquire those courses they need and get credit for completing a program of study rather than only a series of courses.

	Units
Select from the following	3
Plant 2: Plant Propagation	
Plant 96/196: Crop Project* (AET 3 and instructor's permission)	
Plant 150: Crop Improvement* (Bot 10 or Biol 10)	
Select from the following	6
Pl Pr 103: Economic Entomology* (Bot 10 or Biol 10 or Zool 10)	
Pl Pr 105: Weeds* (Bot 10 or Biol 10 and Chem 3A)	
Pl Pr 106: Plant Pathology* (Bot 10 or Biol 10)	
Select from the following	3
SI 2: Agricultural Water	
SI 100: Soils* (Chem 3A)	
Select from one of the option areas in Plant Science (at least 6 units must be upper division)	9
Total	21

* Course requires a prerequisite.

Bachelor of Science Degree Requirements

Agricultural Science Major

Option I: Production (Agricultural Engineering Technology)

The flexibile agricultural science degree enables students interested in agricultural engineering technology related careers to choose appropriate programs of study in power and machinery, automation, food technology, and soil and water.

The **power and machinery** program of study is the recommended curriculum for students interested in designing, testing, installing, selling, servicing or recommending agricultural equipment. An alternative curriculum is available in this program of study for students wishing to gain necessary business management background while increasing their knowledge of mechanized agriculture.

The **automation** program of study is the recommended curriculum for students wishing to obtain a strong background in science and industrial technology devoted primarily to agricultural electrification, construction, automation, waste management, and the development and management of farm equipment.

The **food technology** program of study is the recommended curriculum for students wishing to obtain a strong background in science and technology devoted primarily to food production operations, processing and handling, food industry management, and waste management.

The **soil and water** program of study is recommended for students interested in designing, fabricating, testing, installing, selling, servicing, or recommending irrigation facilities and systems.

Units

General Education (including 9 upper-division units, after completing 56 units of coursework) 51
- CORE
  - Category 3: Math 70 or Plant 99 (recommended)
- BREADTH
  - Division 1: Chem 3A (required)
  - Division 2: Biol 10 or Bot 10 or Zool 10 (required)
  - Division 3: Plant 105 (recommended)
    Geog 5 (recommended for Soil and Water)
  - Division 4: CFS 38 or FScN 53 (recommended)
  - Division 8: Ag Ec 1 (recommended)
- CAPSTONE
  - Either cluster recommended:
  - Agriculture and Government Policy:
    Ag Ec 150; and Pl Si 150 or Phil 125
  - Energy and Society:
    I T 106 and P Sci 168 or Geog 134 or Econ 117

Major (including 20 upper-division units) 45
- Elect one course from four of these six disciplines ..... (12)
  - Ag Ec
  - AET
  - A Sci
  - FScN
  - Plant Science (Cr Sc, OH, Plant, Pl Pr, VTF)
  - Soils/Irrigation (S I)

Program of Study (select one) ..... (33)
- Power and Machinery
  Select 33 units of departmental courses in consultation with adviser from the following: AET 1, 3, 50, 52, 53, 91, 103, 104, 105, 106, 107, 108, 109, 112, 113, 115, 116; I T 41 and other upper-division courses.
- Automation
  Select 33 units of departmental courses in consultation with adviser from the following: AET 50, 103, 104, 105, 106, 107, 109, 116, 190; I T 41, 52, 53, 74; IS 50, 53 and other upper-division courses.
- Food Technology
  Select 33 units of departmental courses in consultation with adviser from the following: AET 1, 50, 53, 103, 106, 108, 109, 110, 115, 116, 180, 190; Ag Ec 31; Plant 101 and other upper-division courses.
- Soil and Water
  Select 33 units of departmental courses in consultation with adviser from the following: AET 3, 50, 53, 91, 106, 108, 115, 116, 190; SI 2, 100, 100L, 111, 112; Plant 134 and other upper-division courses.

Additional requirements 15–32
- Satisfy upper-division writing skills requirement by UDWE exam offered each semester or Plant 110W
- Power and Machinery
  - Ag Ec 31; SI 2, 100, 100L; Phys 2A
  - Students desiring business management courses take: Ag Ec 28, 110N, 120, 160
  - Students not desiring business management courses take: Const 105; I T 74
- Automation
  - Phys 2A
  - Select 25–27 units in consultation with adviser from the following courses: I T 102, 104, 118, 119, 131, 132, 177, 178; Mgt 104, 106
- Food Technology
  - Chem 3B, 8, 150; Micro 20; FScN 1, 110, 125; Ag Ec 120, and 124
- Soil and Water
  - Phys 2A; Ag Ec 28, 110N; I T 41; Plant 12; and SI 113

Electives 0–17
- It is strongly recommended that courses supplementary to the program of study be selected in consultation with the faculty adviser.

Total requirements (including 40 upper-division units) 128

Advising Notes:

See *Advising Notes*, Plant Science Major, Production Management Emphasis

Agriculture Minor

A minor in agriculture (agricultural engineering technology) consists of 21 units of which 9 must be upper-division. At least 12 units must be taken in the AET prefix. The minor program is planned with an adviser and must be certified by the department chair and the school dean. The certified minor program is filed with the Office of Evaluations.

Master of Science Degree Requirements

The Master of Science degree in Plant Science with authorized options in crop science, soils and irrigation, and plant protection is a 30-unit program designed to provide advanced studies and in-depth knowledge in the fundamentals of plant physiology and experimental design, as well as technical writing and formal presentation of research reports.

This degree is for individuals seeking career advancement in agronomy, agricultural research and development, plant physiology, pest management, plant pathology, and soils and irrigation. Graduate courses are offered in the late afternoon or evening permitting students to earn their degree within two years when working closely with an adviser.

Admission Requirements

The Master of Science degree in Plant Science assumes preparation equivalent to a Bachelor of Science in Plant Science. The following courses or equivalents are expected to be completed prior to enrollment in courses to be applied to the master's program: Chem 3A, 3B (or 2A and 2B) and 8; Bot 10, 104; Biol 135 or equivalent; Plant 99 or Math 101; SI 2, 100, 100L; Pl Pr 103, 105, 106.

Admission by the university does not imply acceptance in the master's program in plant science. Applicants whose preparatory education was principally in a language other than English must earn a minimum TOEFL score of 550.

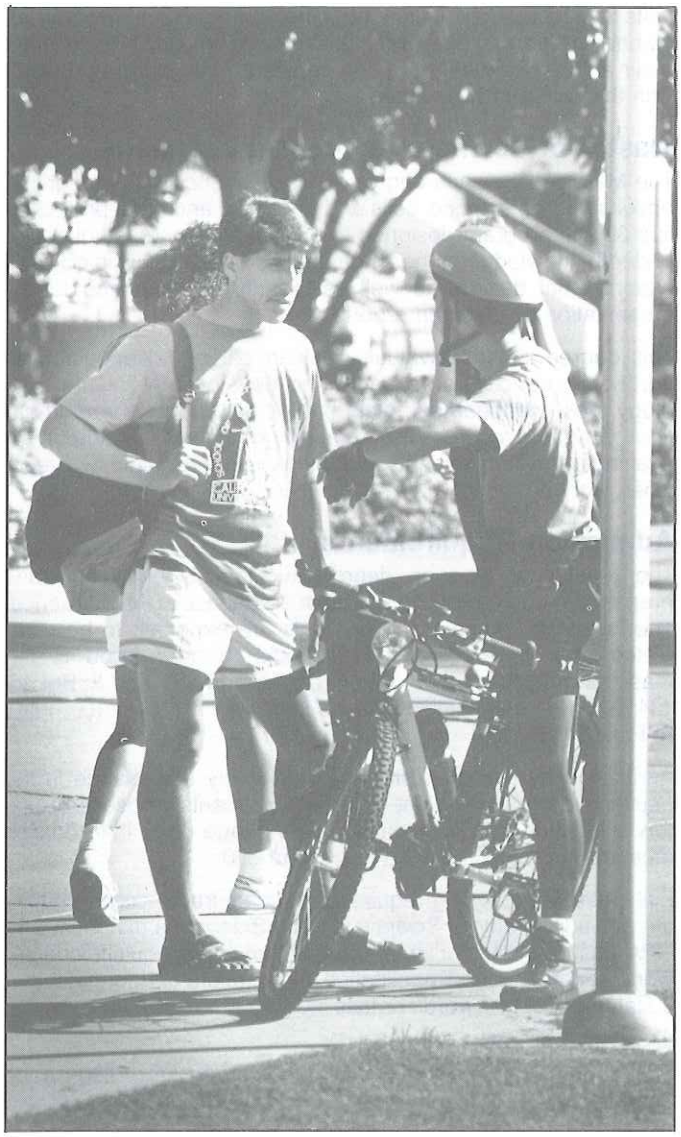
Full classified standing requires a baccalaureate degree equivalent to a Bachelor of Science in Plant Science; a minimum 2.75 GPA (last 60 semester units); completion of prerequisite coursework; separate school application, three letters of reference, and a statement of 500 words or less indicating reasons for pursuing a master's degree.

The student shall achieve a minimum total score of 880 on the Graduate Records Examination (GRE) Verbal and Quantitative

sections. The student shall achieve a minimum score of 450 on the Verbal section of the GRE. At the discretion of the department chair, a lesser score on the Verbal section of the GRE may be accepted by the department as long as the combined score of Verbal and Quantitative sections is 880. Conditional classified standing may be granted by the department to applicants who have a minimum GPA of 2.5 (last 60 semester units), and who have 9 or fewer units of prerequisite courses to complete. Students must achieve a 3.0 GPA on prerequisite coursework.

Students must achieve full classified standing in the program by the semester in which a maximum of 10 units to be used toward the master's degree are completed.

Students are not normally accepted into the Master of Science in Plant Science degree program if they have more than 10 units of prerequisite courses to complete. Prerequisite coursework cannot be used to fulfill the 30 unit master's program requirements. Potential graduate students who have 10 or more units of prerequisite courses to complete are encouraged to enroll as unclassified postbaccalaureate students in Plant Science at CSUF and apply to the master's program when they have 9 or fewer units of prerequisite courses to complete. Students must achieve a 3.0 GPA on prerequisite coursework.



Program Requirements

Thesis Plan

All students must complete a 9-unit common core. Students focus their program on an authorized option to meet educational/professional goals by taking the 9 units of coursework within the selected option and by the appropriate selection of 5 units of approved electives, of which a maximum of 5 units can be 100 series. A 3-unit thesis completes the program of study.

	Units
Core	9
Agri 200, Agri 220, Plant 257	
Additional requirements	
Agri 201 (3), Plant 270 (1)	4
Option	9
Crop Science: Plant 252, 254, 255	
Soils/Irrigation: Plant 253, 256, 259	
Plant Protection: Plant 251, 258, 261	
Electives	5
In consultation with the adviser, students select from the approved elective list. A maximum of 5 units may be 100 level.	
Culminating experience	3
Plant 299	
Total minimum requirements	30

Comprehensive Examination Plan

All students must complete a 9-unit common core. Students focus their program on an authorized option to meet educational/professional goals by taking the 9 units of coursework within the selected option and by the appropriate selection of 8 units of approved electives, of which a maximum of 6 units can be 100 series. A comprehensive examination completes the program of study.

	Units
Core	9
Agri 200, Agri 220, Plant 257	
Additional requirements	
Agri 201 (3), Plant 270 (1)	4
Option	9
Crop Science: Plant 252, 254, 255	
Soils/Irrigation: Plant 253, 256, 259	
Plant Protection: Plant 251, 258, 261	
Electives	8
In consultation with the adviser, students choose from the approved elective list. A maximum of 6 units may be 100 level.	
Culminating experience	0
Comprehensive examination	
Total minimum requirements	30

Graduate Advising Notes:

1. Several of the approved elective courses have prerequisites other than courses listed as admission requirements.
2. To obtain the required school application form and more specific information concerning the Master of Science in Plant Science degree, interested students should call or write the department office. Upon acceptance in the Master of Science in Plant Science program, students should obtain the *Graduate Student Handbook* from the department office.
3. Upon acceptance into the M.S. in Plant Science program, students will be assigned an initial faculty adviser by the department chair. Students may subsequently select a

faculty adviser upon obtaining his/her approval and notifying the department office of that selection.

4. Electives should be selected from the approved list of 100 and 200 series courses listed in the *Graduate Student Handbook*. Under special circumstances and with prior written approval from the adviser and department chair, a student may select an elective course other than those on the approved list of 100 and 200 series courses listed in the *Graduate Student Handbook*.
5. To progress through the graduate program, the student must
   a. Maintain a minimum GPA of 3.0.
   b. Complete all prerequisite coursework.
   c. Attain classified standing.
   d. Meet the university graduate writing requirement.
   e. File for advancement to candidacy.
   f. Pass the department qualifying examination.
   g. Complete the program requirements.
   h. File a master's thesis committee assignment form.
   i. Formally present and defend the thesis research results.
6. Advancement to candidacy requires the completion of 9 program units in residence, meeting the university graduate writing requirement and filing a petition for advancement to candidacy a minimum of one semester prior to enrollment in thesis and within the deadline.
7. The student may meet the university graduate writing requirement by earning a minimum of 450 verbal on the GRE. If a minimum of 450 verbal is not met by a student, the student shall meet the requirement by earning a score of 80 or higher in the Upper-Division Writing Examination (UDWE) or by earning a *B* or better in a designated W course to be specified by the graduate committee of the School of Agricultural Sciences and Technology.
8. All students must successfully complete the department qualifying examination, which is taken as soon as possible after completing the required plant science core courses — Agri 200, 201, 220 and Plant 257. Additional information on the department qualifying examination is included in the *Graduate Student Handbook*.
9. See *Division of Graduate Studies and Research* section in this catalog for university requirements.

COURSES

Note: Active immunization against tetanus (available through Student Health Services) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the University Farm.

Note: Cost to the student of extended field trips varies each semester depending upon itinerary. Student should ask the course instructor.

Plant Science (Plant)

1. Introduction to Plant Science (3). Principles of plant structure, heredity, physiology and climate in relation to growth, adaptation and management of crops. Emphasis is placed on food and fiber crops. (Former Plant 10)

2. Plant Propagation (3). Principles and practices of propagating plants, sexual and asexual. Seeds, cuttings, layering, grafting and budding. Propagation media and rooting aids. (2 lecture, 3 lab hours) (Former Plant 20)

The main reason for my wanting to work at Hughes Aircraft is that I can bring new technologies, new ideas, and new concepts back to my students.

Arthur L. Foston
Professor, Industrial Technology

12. Microcomputers in Plant Science (3). Prerequisite: intermediate algebra. An introduction to plant science problems and exercises involving the microcomputer. Crop production, soils, irrigation, and pest management data will be handled with spreadsheet and word processing programs. (2 lecture, 3 lab hours) (Former Plant 170T section, Plant 112)

80. Undergraduate Research (1–4; max total 4). Open to freshmen and sophomores with permission of instructor. Exploratory work on a suitable agricultural problem in plant science. Approved for *SP* grading.

96. Crop Projects (1; max total 4). Prerequisite: AET 3 or equivalent; Cr Sc 1, VTF 1, or OH 1; and permission of instructor. Grow a crop on the campus farm with faculty guidance, from budget decisions through cultural practices to marketing and sale. Cotton, vegetables, agronomic crops, grapes, fruit, ornamental plants, etc. Earn up to $600 per project.

99. Applied Agricultural Statistics (3). Introduction to experimental methods and statistical procedures used in agricultural research. Self-paced laboratories enable students to become familiar with input, editing and analysis of data via computer. General Education CORE, Quantitative Reasoning. (1 lecture, 6 lab hours) (Former Plant 100)

101. Postharvest Handling of Perishable Plant Crops (3). Prerequisite: Bot 10 or Biol 10. Principles of handling fresh produce, floral and nursery stocks. Harvesting, packaging, storage and transportation. (2 lecture, 3 lab hours; 2-day field trip) (Field trip fee, $50–75) (Former Plant 166)

102. Micropropagation (3). Prerequisite: Bot 10 or Biol 10; and Bot 104 or Chem 150 or permission of instructor. Principles of plant propagation by aseptic cell and organ culture as a means of rapid cloning, elimination of systemic plant diseases, production of somatic hybrids, ploidy change and other genetic variants for use in plant breeding. (2 lecture, 3 lab hours) (Former Plant 170)

105. Food, Society and Environment (3). Prerequisite: General Education BREADTH, Divisions 1, 2 and 8 completed (or concurrent enrollment). Linkages among food production systems, human social behavior and environmental quality. Basic principles of environmental and agricultural sciences as applied to interrelationships among social value systems, agricultural activities and environmental resources. General Education BREADTH, Division 3.

110W. Dimensions in Agriculture (3). Prerequisite: Engl 1; completion of 56 units. Current agricultural problems and developments; nature of agricultural industries in a changing world. Interrelationships among agriculture, government, labor, and the public. Meets the upper division writing skills requirement for graduation.

134. Microclimatology (3). (Same as Geog 114.) Prerequisite: Geog 5 or 111. Study of micrometeorologic influences in local climates. Climatic factors influencing agriculture with specific reference to the San Joaquin Valley. Course designed for anyone interested in the relations between climate and agriculture, regardless of major. (Former Plant 170T section)

137. Apiculture (3). Prerequisite: Bot 10 or Biol 10 or Zool 10. Biology and behavior of honeybees; hive manipulation; diseases and enemies; foraging activities in pollination; production and marketing of honey and beeswax; laws and regulations. (2 lecture, 3 lab hours) (Former Plant 91)

150. Crop Improvement (3). Prerequisite: Bot 10 or Biol 10. Application of genetic, cytological and environmental principles to improvement of plants; heredity and variation in plants, effects of environmental factors, biotechnology, self- and cross-fertilization, principles and results of selection and hybridization in plant improvement. (Former Plant 140)

170T. Topics in Plant Science. (1–4; max total 6 per discipline if no topic repeated). Prerequisite: junior standing. Selected topics in plant science, agronomy, horticulture, and other associated areas. Topics may require lab hours.

180. Undergraduate Research (1–4; max total 4). Open to juniors and seniors. Exploratory work on a suitable agricultural problem in plant science. Approved for *SP* grading.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

194. Agricultural Internship (1–8; max total 8). Prerequisite: junior standing; approval of faculty adviser and department chair. Field experience in your career specialty that integrates with classroom instruction. Written reports of knowledge and experience gained are required. *CR/NC* grading only.

196. Crop Projects (1; max total 4). Prerequisite: AET 3 or equivalent; Cr Sc 1, VTF 1, or OH 1; junior or senior standing; and permission of instructor. Grow a crop on the campus farm with minimal faculty supervision, from budget decisions through cultural practices to marketing and sale. Cotton, agronomic crops, grapes, fruit, ornamental plants, etc. Earn up to $600 per project.

Crop Science — Agronomy and Vegetable Crops (Cr Sc)

1. Introduction to Crop Science (3). Principles of production for cereal, row, forage and vegetable crops. Culture, insect and disease control, harvesting, storage and marketing. (Cr Sc 1L required for majors) (Former Plant 13, Plant 14)

1L. Introduction to Crop Science Lab (1). Prerequisite: Cr Sc 1 or concurrently. Systematic examination of structure, classification, crop culture, handling, storage and marketing of selected agronomic crops grown in the San Joaquin Valley. (3 lab hours; 2-day field trip; fee $35–65) (Former Plant 13; Cr Sc 1A, 1B)

101. Row Crops (3). Prerequisite: Bot 10 or Biol 10, Cr Sc 1. The culture of beans, cotton, sugar beets, and other fiber and oil crops; varieties, nutrition, insect, disease and weed control; harvest, storage, uses and marketing. (2 lecture, 3 lab hours) (Former Plant 33 and 123)

102. Cereal Crops (3) Prerequisite: Bot 10 or Biol 10, Cr Sc 1. The culture of barley, corn, grain sorghum, oats, rice, rye and wheat; varieties, nutrition, insect disease and weed control; harvest, storage, uses and marketing. (2 lecture, 3 lab hours; two 1-day field trips) (Former Plant 43 and 123)

103. Forage Crops (3). Prerequisite: Bot 10 or Biol 10, Cr Sc 1. The culture of alfalfa, silage, irrigated pasture and range related to livestock feed enterprises; varieties, nutrition, insect, disease and weed control; harvesting, uses and marketing. (2 lecture, 3 lab hours) (Former Plant 133)

104. Seed Production and Technology (3). Prerequisite: Bot 10 or Biol 10, Cr Sc 1. The principles of specialized agronomic seed production; harvesting, mechanical conditioning, storage, treatment and viability testing. (2 lecture, 3 lab hours; 2–3 day field trip; fee $35–65) (Former Plant 113, Plant 143)

105. Range Management (3). Prerequisite: Bot 10 or Biol 10, Cr Sc 1. Identification of range plants; carrying capacity; methods of range improvement, grazing management, water development, rodents, fertilization, reseeding, brush removal; mountain range resources. (2 lecture, 3 lab hours) (Former Plant 173)

111. Warm Season Vegetables (3). Prerequisite: Bot 10 or Biol 10, Cr Sc 1, Cr Sc 1L. Cultural practices, harvesting, processing, and marketing of warm season vegetables of economic importance to California and the San Joaquin Valley. (2 lecture, 3 lab hours; 2–3 day field trip; fee $35 to $65) (Former Plant 114)

112. Cool Season Vegetables (3). Prerequisite: Bot 10 or Biol 10, Cr Sc 1, Cr Sc 1L. Cultural practices, harvesting, processing, and marketing of cool season vegetables of economic importance to California and the San Joaquin Valley. (2 lecture, 3 lab hours; 2–3 day field trip; fee $35 to $65) (Former Plant 124)

113. Small Farms and Gardens (3). Prerequisite: Bot 10 or Biol 10, Cr Sc 1. Intensive production of vegetables and small fruits for the small-scale grower and home gardener. Application of organic and synthetic methods of growing food. Principles of composting, mulching, crop rotation, interplanting, natural and synthetic fertilizers, biological and chemical control of insects and diseases. (2 lecture, 3 lab hours) (Former Plant 154)

120. Advanced Crop Science (3). Prerequisite: Bot 104, six units Crop Science. Interrelationships between varietal development, pest resistance, modification of crop physiology in agronomic and vegetable crops; the resultant changes in production techniques and productivity; their impact on industry, management and the environment. (Former Plant 183, Plant 174)

Ornamental Horticulture (OH)

1. Introduction to Ornamental Horticulture (3). Planting and maintenance of the home landscape; selection, planting, fertilization, and pruning of plants; lawn planting and care. (2 lecture, 3 lab hours) (Former Plant 15)

2. Introduction to Landscape Design (3). History and development of landscape design. A study of the need for landscaping in modern man's environment. Consideration of landscaping practices for the modern home and their effect on the home microenvironment. (Former Plant 55)

3. Plant Identification (3). Identification, growth habits, culture and landscape use of shrubs, vines, ground covers, herbaceous perennials and annual bedding plants. Use of identification keys. (2 lecture, 3 lab hours) (Former Plant 25)

4. Floral Design (3). Principles and rules of design and color using plants as a media; European and Japanese influences; emphasis on American line-mass and contemporary designs. An assortment of arrangements are made in lab. (Course fee: $25) (2 lecture, 3 lab hours) (Former Plant 65, 135; OH 103)

5. Nursery Management I (3). Prerequisite: Bot 10 or Biol 10, Plant 2, OH 1. Design, construction and utilization of nursery structures; production of annual and perennial nursery stock with emphasis on wholesale nursery practices. (2 lecture, 3 lab hours) (Former Plant 35, 175; OH 104)

101. Floriculture I (3). Prerequisite: Bot 10 or Biol 10, OH 1. The construction, operation and management of greenhouses; cultural and environmental techniques used in the production of summer and fall florist crops. (2 lecture, 3 lab hours; field trip) (Former Plant 145)

102. Floriculture II (3). Prerequisite: Bot 10 or Biol 10, OH 1. Cultural and environmental techniques used in the production of winter and spring floral crops. (2 lecture, 3 lab hours; field trip) (Former Plant 195)

105. Nursery Management II (3). Prerequisite: OH 5 and/or permission of instructor. Practices and principles in planning and managing a retail nursery, flower shop or garden center; includes special occasion floral designs. (2 lecture, 3 lab hours; field trips) (Former Plant 175)

106. Landscape Graphics (3). Prerequisite: OH 2. Lettering and graphic techniques used in developing landscape plans, including symbols and rendering techniques. Site plan, elevation and section drawing. (1 lecture, 6 lab hours) (Former Plant 115)

107. Advanced Landscape Design (4). Prerequisite: OH 3, OH 106; recommend OH 108. The analysis and solution of design problems as they relate to the site development of residential and commercial structures. (2 lecture, 6 lab hours) (Former Plant 185)

108. Ornamental Trees (3). Prerequisite: Bot 10 or Biol 10, OH 1. Trees grown in California for landscaping, shade and ornamentation; identification, habits of growth, cultural requirements, landscape use. (2 lecture, 3 lab hours; field trip) (Former Plant 125)

109. Arboretum and Botanical Gardens (2). Prerequisite: Bot 10 or Biol 10, OH 1. Origin and development of botanical gardens. Emphasis on U.S. and California gardens, their design and influence on city and regional park systems. (1 lecture, 3 lab hours; 3 Saturday field trips) (Former Plant 105)

110. Turfgrass Production and Management (3). Prerequisite: Bot 10 or Biol 10, OH 1. Production and maintenance of grass for lawns, public parks, public institutions, playgrounds, playing fields, golf courses, bowling greens; identification of turfgrasses and turfgrass seed. (2 lecture, 3 lab hours; field trip) (Former Plant 165)

Plant Protection (Pl Pr)

1. Introduction to Plant Protection (3). Origin, history and evaluation of protective measures (chemical, biological and cultural) for control of insects, diseases, weeds, and rodents in the field and around the home. (Former Plant 21)

101. Agricultural Chemical Applications (3). Prerequisite: Intermediate Algebra. Application techniques of agricultural chemicals: fertilizers, insecticides, herbicides, fungicides, nematocides, fumigants. Emphasis on effective and safe use of chemicals and on equipment calibration to ensure proper rate of application. (2 lecture, 3 lab hours) (Former Plant 132)

102. Properties of Pesticides (3). Prerequisite: Chem 3B or 8. Typical uses, modes of action, mechanisms of selectivity, environmental interactions, and user safety of insecticides, herbicides, fungicides, nematocides, rodenticides and plant growth regulators. (Former Plant 151)

103. Economic Entomology (3). (See Ent 106) (Former Plant 121)

104. Plant Nematology (3). Prerequisite: Zool 10 or Biol 10, Pl Pr 1. Morphology, life history, host plant relationships, and population management of economically important nematodes with emphasis on plant-parasitic forms. (Former Plant 161)

105. Weeds (3). Prerequisite: Bot 10 or Biol 10, Chem 3A. Weed control in California. Identification of common weeds. Fundamentals of preventive, cultural, biological, physical and chemical weed control methods. (2 lecture, 3 lab hours) (Former Plant 131)

106. Plant Pathology (3). Prerequisite: Bot 10 or Biol 10. Study of the causal agents, disease cycles, and control of plant diseases. (2 lecture, 3 lab hours) (Former Plant 171)

107. Biological Control (3). Prerequisite: Pl Pr 103. A study of the action of parasites, predators, and pathogens on the population dynamics of their host/prey organisms, with special emphasis on insects and mites. (2 lecture, 3 lab hours) (Former Plant 170T section)

108. Integrated Pest Management (3). Prerequisite: Pl Pr 103. Concepts and principles of integrated pest management. Insect and mite pest problems; sampling techniques; biology and ecology of major agricultural crop pests; integration of control measures for management of economic pests. (2 lecture, 3 lab hours) (Former Plant 191)

109. Diagnosis of Plant Diseases (3). Prerequisite: Pl Pr 106 or concurrently. Techniques for the diagnosis of specific diseases in field, greenhouse, and laboratory settings. Students will practice diagnostic techniques for the major plant diseases occurring in California. (2 lecture, 3 lab hours) (Former Pl Pr 106A, 106B, 106C; Plant 171A, 171B, 171C)

Soils/Irrigation (SI)

1. Introduction to Irrigated Soils (3). An introduction to soil science with emphasis on irrigated agriculture. General topics include basic soil properties, soil-water, plant nutrition and water management. (2 lecture, 2 lab hours)

2. Agricultural Water (3). Prerequisite: intermediate algebra. Water resources and problems in California; water requirements for agricultural and ornamental crops; irrigation scheduling and application methods. (2 lecture, 3 lab hours) (Former Plant 59, SI 110)

100. Soils (3). Prerequisite: Chem 3A, Intermediate Algebra. Physical, chemical and biologic properties of soils as a medium for plant growth and as a natural body, factors that influence soil formation; food and fiber production; fertilizer and soil amendment use and environmental impact; soil's role in the biosphere. (Saturday field trip) (Former Plant 108)

100L. Soils Lab (1). Prerequisite: SI 100 (or concurrently). Physical, chemical and biological analysis. Interpretation of field and laboratory data. (3 lab hours) (Former Plant 108L)

101. Soil Fertility and Fertilizers (4). Prerequisite: SI 100. Evaluation of nutrient elements in soils; application of fertilizers and organic waste to meet nutrient requirements; soil and plant tissue analysis and interpretation; fertilizer recommendations for different crops. (3 lecture, 3 lab hours) (Former Plant 138, Plant 148)

102. Soil Classification and Survey (3). Prerequisite: SI 100. Influence of environmental factors on soil development; description and identification of soil profiles; mapping, and interpretation of soil maps. (2 lecture, 3 lab hours) (Former Plant 118)

103. Soil Conservation (3). Prerequisite: SI 100. Fundamental considerations of soil conservation; prediction and controlling of soil erosion; universal soil loss equation and its applications; conservation practices; irrigation and drainage; farm and watershed planning. (Former Plant 168)

104. Soil Management (3). Prerequisite: SI 100. Factors affecting soil fertility, management of soils, attaining continuous optimum productivity. Physical, chemical, and field tests for soil productivity; implications for crop management. (2 lecture, 3 lab hours) (Former Plant 128)

105. Soil Chemistry (3). Prerequisite: Chem 3B, 8; SI 100. The chemistry of soils, agricultural chemical use, and waste disposal impacts. Student research project and report required. (2 lecture, 3 lab hours) (Former Plant 158)

111. Irrigation Design I (3). Prerequisite: SI 2. Design, installation and operation of irrigation systems for field, vine, and tree crops. (2 lecture, 3 lab hours) (Former Plant 129)

112. Irrigation Design II (3). Prerequisite: SI 2. Design, installation, and operation of irrigation systems used for ornamental plants, turf areas, nurseries, and greenhouse operations. (2 lecture, 3 lab hours) (Former Plant 119)

113. Water Management (3). Prerequisite: SI 2. Management and planning of irrigation systems with regard to crop water requirements, scheduling, evaluation of irrigation efficiency and salinity problems. (Former Plant 170T section)

114. Pumps and Motors (3). (See AET 115.)

Viticulture/Tree Fruit (VTF)

1. Introduction to Grape and Tree Crops (3). Origin and history of the grape and the tree fruit industries, as well as their culture in California; current trends in fresh, dried and processed segments of the industry. (Former Plant 16, Plant 17, FS 1)

101. Grape Production I (3). Prerequisite: Bot 10 or Biol 10, VTF 1. Current status and future of the grape industry; commercial classes of grapes; climatic and soil requirements for grape growing. Principles and practices of vineyard fertilization, cultivation, and pruning. (2 lecture, 3 lab hours) (Former Plant 107, FS 101)

102. Grape Production II (3). Prerequisite: Bot 10 or Biol 10, VTF 1. Planning of new vineyards. Principles and practices of propagation, planting, and training grapes. Morphology and physiology of the grapevine and response of the vine to growth regulators and other means of improving grape quality. (2 lecture, 3 lab hours) (Former Plant 117, FS 102)

103. Raisin Production and Processing (3). Prerequisite: Bot 10 or Biol 10 or VTF 1. Principles and practices of raisin production; sun drying, mechanical dehydration, on-the-vine drying; new raisin processes to produce new products. (2 lecture, 3 lab hours) (Former Plant 27, FS 103)

104. Grape Varieties (3). Prerequisite: Bot 10 or Biol 10 or VTF 1. Grape varieties common to California; rootstocks and species; identification, adaptability, use and acreage; taste testing fresh grapes. (2 lecture, 3 lab hours) (Former Plant 127, FS 104)

110. Fruit Species of California (3). Prerequisite: Bot 10 or Biol 10 or VTF 1. Fruit and nut species common to California, their adaptation and uses. (Former Plant 106, FS 110)

111. Fruit Production I (3). Prerequisite: Bot 10 or Biol 10 or VTF 1. Adaptation of fruits to their environment; training, pruning; propagation; varieties and rootstocks; fundamentals of fall cultural practices. (2 lecture, 3 lab hours) (Former Plant 116, FS 111)

112. Fruit Production II (3). Prerequisite: Bot 10 or Biol 10 or VTF 1. Fruit and vegetative development; pollination; nutrition; product utilization; fundamentals of spring cultural practices. (2 lecture, 3 lab hours) (Former Plant 126, FS 112)

113. Tropical Fruit Production (3). Prerequisite: Bot 10 or Biol 10 or VTF 1. The production of fruits in tropical climates. Emphasis on citrus, pineapple, papaya, mango and banana. (Former Plant 136, FS 113)

120. Orchard-Vineyard Management (3). Prerequisite: 6 units Viticulture/Tree Fruit courses. Relating the various cultural techniques to the physiology of trees and vines, survey of scientific literature, new development analysis, and management of orchards and vineyards. (2 lecture, 3 lab hours) (Former Plant 186, Plant 187, FS 120)

Agricultural Engineering Technology (AET)

Note: Suitable eye protection is required in many AET laboratory classes.

1. Introduction to Agricultural Mechanics (3). Selection, care and use of common farm tools, projects of wood and metal; mechanical skills in the field of agriculture. (2 lecture, 3 lab hours) (Course fee variable; not less than $7.50) (Former Ag Me 15, Me Ag I)

2. Introduction to Farm Machinery (3). The study of basic functions and applications of farm machinery and equipment. Farm machines common to the San Joaquin Valley will be observed and evaluated for effective performance in their intended purpose. (Former Me Ag 2)



3. Farm Tractors and Equipment (3). Operation and maintenance of farm tractors; operation of farm tractors and equipment under field conditions; service, maintenance and minor repair of engines of wheel and crawler type. (2 lecture, 3 lab hours; 5 hours field operation) (Former Ag Me 17, Me Ag 3)

50. Agricultural Welding (3). Prerequisite: AET I or permission of instructor. Basic metallurgy, arc and gas welding processes in the construction and repair of farm machinery, and the design of welded structures. (2 lecture, 3 lab hours) (Former Ag Me 18, 121; Me Ag 50, 100)

52. Farm and Landscape Structures (3). Prerequisite: AET I or permission of instructor. Site development, construction and repair of farm and landscape structures. Properties and uses of masonry, wood, concrete, and metal. (2 lecture, 3 lab hours) (Former Ag Me 81, 125; Me Ag 52, 102)

53. Agricultural Electrification (3) Fundamentals of circuits, direct and alternating current, accepted wiring methods, lighting methods, selection, application and control of motors and other induction devices. (2 lecture, 3 lab hours) (Former Ag Me 111, 111L; Me Ag 53, 111)

80. Undergraduate Research (1–4; max total 4). Open to freshmen and sophomores with permission of instructor. Exploratory work on a suitable agricultural problem in agricultural engineering technology. Approved for *SP* grading. (Former Ag Me 80, Me Ag 80)

91. Farm Surveying (3). Use of level, transit, compass and laser; land leveling, laying out fields, irrigation ditches, pipelines and drains. (2 lecture, 3 lab hours) (Former Ag Me 91; Me Ag 91, 101)

103. Hydraulic Systems (3). Prerequisite: AET 1, 3. Theory and practice in the operation, service, adjustment, and function of the component parts of fluid power systems. Design application of systems to farm machines. (2 lecture, 3 lab hours) (Former Ag Me 131, Me Ag 103)

104. Farm Machinery I (3). Prerequisite: AET 1, 3. Theory, operation and economics of tillage tools, interaction of the soil and tool; cotton, grain, and specialized harvesting machinery and equipment. (2 lecture, 3 lab hours) (Former Ag Me 115, Me Ag 104)

105. Farm Machinery II (3). Prerequisite: AET 1, 3. Theory, operation, and economics of orchard and field spraying equipment, field and row crop planters, cultivating tools, and haying machinery. (2 lecture, 3 lab hours) (Former Ag Me 116, Me Ag 105)

106. Agricultural Machinery Management (3). Prerequisite: AET 104. Optimization of the equipment phases of agricultural production. Theoretical and practical considerations in efficient selection, operation, cost factors, and replacement of machinery. (2 lecture, 3 lab hours) (Former Me Ag 106)

107. Agricultural Engineering Technology (3). Prerequisite: AET 3. Elements of engineering in agriculture. Power application, equipment efficiency, cost analysis, geometry of land use, and heat transfer. Applications of modern technology in agriculture. (Former Me Ag 107)

108. Agricultural Waste Management (3). Prerequisite: AET 53. Study of properties of waste material, collection, transportation and mechanical handling, mechanical processing, thermal processing, composting, energy recovery and economics. (2 lecture, 3 lab hours) (Former Me Ag 108)

109. Agricultural Processing Technology I (3). Prerequisite: AET 53. Principles of plant operations in the food and fiber industries. Basic theory of heat transfer, fluid mechanics, refrigeration, dehydration, cleaning and sorting, cost analysis and plant layout. (2 lecture, 3 lab hours) (Former Ag Me 147, Me Ag 109)

110. Agricultural Processing Technology II (3). Prerequisite: AET 53. Processing techniques including heat exchange equipment, distillation, process condition, pumps in food industry, and fluid flow measurement. (2 lecture, 3 lab hours) (Former Ag Me 148, Me Ag 110)

112. Farm Power (3). Prerequisite: AET 3. Principles of the internal combustion engine; overhauling, repairing, and adjusting of gasoline, diesel, and L.P.G. farm engines. (2 lecture, 3 lab hours) (Former Ag Me 151, Me Ag 112)

113. Diesel Engines and Power Transmissions (3). Prerequisite: AET 3. Theory and operation of diesel injection systems and turbochargers; clutches; transmissions; brakes; and tractive devices. (2 lecture, 3 lab hours) (Former Ag Me 152, Me Ag 113)

114. Small Engines (3). Prerequisite: AET 1. Not open to students with credit in AET 112. Theory of operation, maintenance and repair of small gasoline internal combustion engines, both 2-cycle and 4-cycle. (2 lecture, 3 lab hours) (Former Ag Me 153, Me Ag 114)

115. Pumps and Motors (3) (Same as SI 114). Prerequisite: AET 53. Operation and study of centrifugal and deep well turbines; testing of pumps and motors under operating conditions to determine efficiency; installation, protective devices, maintenance and proper selection of single and three-phase motors used on the farm. (2 lecture, 3 lab hours) (Former Ag Me 159, Me Ag 115)

116. Agricultural Sensors and Control (3). Prerequisite: AET 53, and Plant 12 or IS 50. Agricultural application of measurement sensors, techniques and systems. Use of the microcomputer to evaluate input signals and regulate processes. (2 lecture, 3 lab hours)

160T. Topics in Agricultural Engineering Technology (1–4; max total 6 per discipline if no topic repeated). Prerequisite: junior standing, permission of instructor. Selected topics in agricultural engineering technology. Topics may require lab hours. (Former Ag Me 160T, Me Ag 160T)

180. Undergraduate Research (1–4; max total 4). Open to juniors or seniors with permission of instructor. Exploratory work on a suitable agricultural problem in agricultural engineering technology. Approved for *SP* grading. (Former Ag Me 180, Me Ag 180)

190. Independent Study (1–3; max see reference). *See Academic Placement — Independent Study.* Approved for *SP* grading. (Former Ag Me 190, Me Ag 190)

194. Agricultural Internship (1–8; max total 8). Prerequisite: junior standing; approval of faculty adviser and department chair. Field experience in your career specialty that integrates with classroom instruction. Written reports of knowledge and experience gained are required. *CR/NC* grading only. (Former Me Ag 194)

GRADUATE COURSES

The following graduate courses are open to students who have been accepted into the graduate program. Students who are not in graduate standing should contact the department graduate coordinator prior to enrolling.

Agriculture (Agri)

200. Biometrics in Agriculture (3). Prerequisite: Math 101 or Plant 99; permission of instructor. Advanced concepts in the design of agricultural experiments. Emphasis is placed on the selection of appropriate designs to meet the objectives of well-planned experiments. Relative merits of various designs and topics in analysis, interpretation, and regression are covered.

201. Agricultural Laboratory Techniques (3). Prerequisite: One of the following courses: Bot 104; Chem 105, 109, 151; Enol 115 or FScN 130. Agricultural problem solving through the application of advances in laboratory technology, crop management, foods, nutrition, soil and water quality. Theory and practice operation of scientific instruments and techniques are taught. Student defined project and report required. (2 lecture, 3 lab hours) (Former Agri 250T section)

220. Research Communications in Agriculture (3). Prerequisite: completion of university writing requirement. Emphasis on critical literature review, scientific writing and oral presentation of research results. Approved for *SP* grading.

Plant Science (Plant)

250T. Topics in Plant Science (3; max total 12). Prerequisite: upper-division plant science appropriate to study topic, permission of instructor. Advanced studies in a given area: crop physiology, plant breeding, plant pathology, plant nutrition, or economics. Topics may require lab hours. (Former Agri 250T section)

251. Pesticides (3). Prerequisite: Bot 10, Chem 8. Modes of action of pesticides. Absorption and translocation of pesticides. Mechanisms of pesticide specificity. Interaction with soil and soil microbes. Biotechnology developments, pesticide use in integrated pest management systems. (Former Agri 251)

252. Plant Nutrition (3). Prerequisite: Bot 104. Mineral requirements of plants; the acquisition and translocation of nutrients by higher plants and the role of nutrient elements in plant development. (2 lecture, 3 lab hours) (Former Agri 252)

253. Irrigation Water Quality (3). Prerequisite: permission of instructor. Effect of irrigation water quality on soil properties and plant growth. Management alternatives for salinity and toxicity problems. Suitability of using waste waters for irrigation. (2 lecture, 3 lab hours) (Former Agri 250T section, Agri 253)

254. Plant Hormones and Regulators (3). Prerequisite: Bot 104,. Chem 8. History of discovery, chemical nature, extraction, and identification of naturally occurring hormones. Physiological and biochemical effects of plant growth substances and hormones. Mechanism of action of auxins, gibberellins, cytokinins, inhibitors (A.B.A.), ethylene, and other hormones. Agricultural impacts of growth regulators. (2 lecture, 3 lab hours) (Former Agri 254)

255. Advanced Plant Breeding (3). Prerequisite: Plant 150. Principles and techniques of plant improvement, breeding methods, combining ability, sterility systems, quantitative genetic analysis, heritability estimates, experimental designs for plant breeding. (Former Agri 255)

256. Plant-Water Relationships (3). Prerequisite: Bot 104. Physicochemical properties of water and solutions; movement of water, solutes, and growth regulators in plants; study of moisture-sensitive periods of various crops; factors affecting water absorption and retention. (Former Agri 256)

257. Physiology of Cultivated Plants (3). Prerequisite: Bot 104. Plant cell structure and function. Response of cultivated plants to the environment. Physiology and hormonal control of flower induction, fruit set, and development. Review of pertinent current publications. (Former Agri 257)

258. Plant Disease Control (3). Prerequisite: Pl Pr 106. Principles of plant disease control. Methods and theory used in application of chemicals, biological control and breeding for resistance. Insight into industrial research and development of control measures. (2 lecture, 3 lab hours) (Former Agri 258)

259. Physical Properties of Soil (3). Prerequisite: SI 100; Math 70 recommended. Study of physical properties of soil and water as they relate to plant growth — nature and behavior of clays. Energy relationships of soil-water and its movement in soil. Soil structure, air, soil temperature and soil color as they relate to soil productivity. (2 lecture, 3 lab hours) (Former Agri 250T section, Agri 259)

261. Advanced Pest Management (3). Prerequisites: Pl Pr 108 or permission of instructor. Comprehensive study of insect, disease, and weed pest problems in important California cropping systems. Examination of complex relationships among pests, crops, and other components of these agroecosystems leads to design of economically viable and ecologically sound management programs. (2 lecture, 3 lab hours). (Former Agri 250T section, Agri 261)

270. Seminar in Plant Science (1; max total 4). Prerequisite: permission of instructor. Reviews of published and/or original research in the areas of crop development, soils and irrigation, and crop protection. (Former Agri 270)

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading. (Former Agri 290)

299. Thesis (3). Prerequisite: Prior advancement to candidacy. See *Criteria for Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Oral defense of thesis required. Approved for *SP* grading. (Former Agri 299)

IN-SERVICE COURSE *(Agri)*

(See *Course Numbering System.*)

300. Topics in Agriculture (1–3). Topics may require lab hours. In-service professional training in selected areas of agriculture.

Anthropology

School of Social Sciences
Department of Anthropology
Shien-min Jen, Chair
Peters Business Building, Room 389
(209) 278-3002

B.A. in Anthropology
Minor in Anthropology

Anthropology is concerned with everything that is human, in all parts of the world, both present and past. It is unique among the social sciences in the breadth of its scope. Most disciplines focus only on modern civilization or concentrate on single aspects of life, such as government or the economy. Anthropology is interested in *all* human societies and views life as a complexly integrated whole that is more than the sum of its parts. It is the human experience as a whole that anthropology seeks to understand.

The breadth of anthropology is reflected in its four subfields. **Physical anthropology** studies biological evolution and how heredity conditions the ways we conduct life. **Cultural anthropology**, by studying the enormous diversity of lifeways in contemporary cultures throughout the world, attempts to explain both differences and similarities in the way different peoples carry out the process of living. **Archaeology** explores the human past far beyond the range of written records, using specialized techniques to probe human prehistory. **Linguistic anthropology** investigates the nature of language and the critical role it has played in developing our unique intellectual capabilities and behavior. The central concept in anthropology is "culture," and it is this vital idea which binds the subfields into an integrated discipline.

The Anthropology program has three goals:

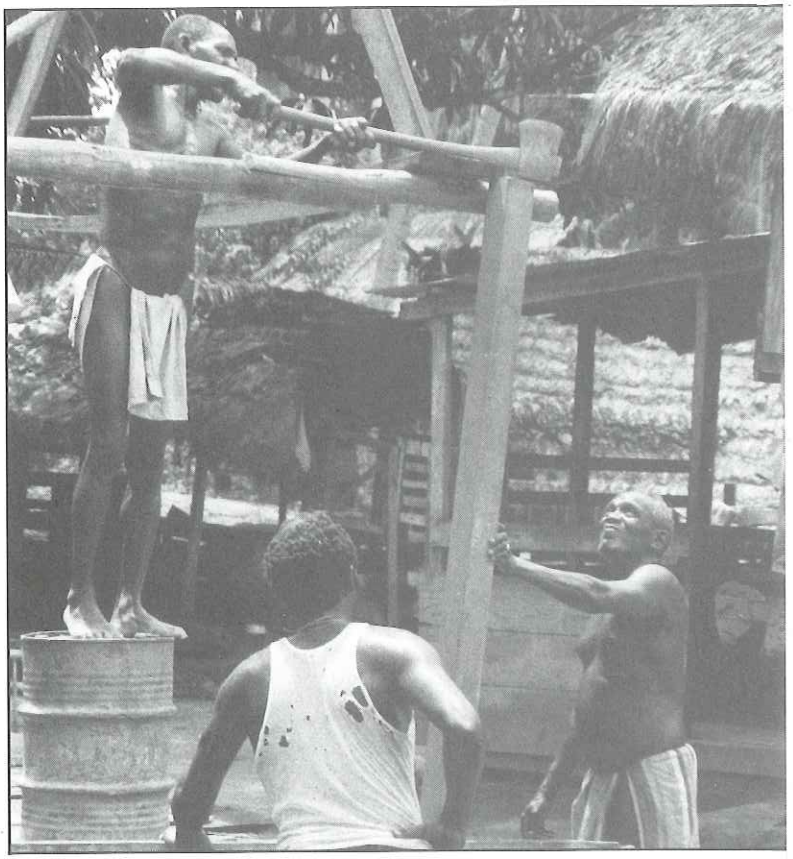
- To provide students with a clear conception of human variability and its implications, enabling them to understand and deal with lifestyles other than those of Mainstream America.
- To provide students with the broad intellectual skills that are essential to the widest range of professional careers.
- To provide students who wish to pursue a professional career in anthropology with a thorough preparation for graduate work in major doctoral programs.

Both the anthropology major and minor offer a varied but well-structured exposure to all four subfields of the discipline. The major consists of two parts. The **core curriculum** introduces both data and theory in a logical sequence of courses from basic to advanced and includes an introduction to anthropological field work. The **elective curriculum** offers a wide selection of courses ranging from traditional topics to current issues in anthropology and the contemporary world. The minor is a briefer but balanced survey of the discipline, designed to complement any major whose graduates need to understand and deal with people from differing cultural backgrounds.

The faculty is committed to working closely with students to encourage their intellectual growth and development of skills that are both personally satisfying and in demand by employers in many career settings. Anthropology courses, especially at the advanced level, teach students to read critically, write fluently, organize information cogently, and interrelate ideas logically and creatively. For those who may consider becoming professional anthropologists, we point with considerable pride to the fact that virtually all of our graduates who have chosen this path have been accepted into a graduate program of their choice.

Career Opportunities

Career opportunities for anthropology graduates are increasingly numerous and varied because cultural pluralism and international communication are on the increase. There is a growing need for people with cross-cultural sophistication and an ability to mediate between value systems. Graduates of our department have established successful careers in such fields as personnel work, mental health, social research, education, law enforcement, business and government.



Students who contemplate graduate study, whether in anthropology or another field, find that our program is both rigorous and thorough. In fact, anthropological training at the undergraduate level is widely recognized as excellent preparation for advanced degrees in many professional fields. Graduates of this department have completed graduate programs in medicine, law, social work, international business and international relations, to name a few.

Professional careers in anthropology itself usually require the Ph.D. At present, traditional academic posts are scarce. However, enterprising anthropologists throughout the nation have been remarkably successful in securing high-level positions in both government and business, usually under titles other than "anthropologist." These successes indicate that employers at the highest levels appreciate the unique training and capabilities of professional anthropologists. While such positions are not yet common, imaginative anthropologists who can communicate their special abilities should be able to establish rewarding careers in a variety of settings.

Faculty

Shien-min Jen, *Chair*

Thomas Bowen
Roger M. LaJeunesse
Mary A. Ludwig
Franklin C. L. Ng
Sydney R. Story
Dirk H. van der Elst

Bachelor of Arts Degree Requirements
Anthropology Major

	Units
I. Major requirements [1]	27–29
A. *Core curriculum*	(9–11)
Anth 1	(3)
Anth 2 or Anth 15 [2]	(3–5)
Anth 3	(3)
B. *Elective curriculum*	(18)
Six 3-unit courses from Areas II through VIII	
II. General Education requirements	51
III. Second major, electives and remaining degree requirements	44–49 [3] *
(See *Degree Requirements.); may be used toward a dual major or minor.*	
Total	124

* This figure takes into consideration the fact that a maximum of 3 units of Anth 1, 2 or 15, or 3 may also be applied toward the General Education requirements. Consult the anthropology department chair or faculty adviser for further information.

Students planning to pursue graduate training in any aspect of Anthropology are advised to take a more rigorous program of coursework designed specifically to facilitate that goal.

Anthropology Minor

	Units
I. Minimum Minor requirements [1]	18–20
A. *Core curriculum*	(9–11)
Anth 1	(3)
Anth 2 or Anth 15	(3–5)
Anth 3	(3)
B. *Elective curriculum*	(9)
Three 3-unit courses from areas II-VIII	
II. Additional university and major units	104–106
Total	124

Notes:

1. *CR/NC* grading is not permitted in the anthropology major or minor.
2. Anth 15, a special 5-unit course, is part of the cluster-course "Man and the Natural Environment," a 17-unit program integrating anthropology, biology and geology, and involving extended field trips in the Western states. It requires concurrent enrollment in Biol 15, Geol 15 and N Sci 15.
3. Units in this category as well as in General Education may also be applied toward a dual major or minor as appropriate (see *Dual Major* or departmental minor).

Asian-American Studies

Asian-American courses familiarize students with the historical, socioeconomic and cultural adaptions that peoples from Asia made to live in the United States. The curriculum is designed to enable professional men and women to understand and to interact with people from ethnic subcultures in our pluralistic society. The Asian-American Studies minor therefore complements any major concerned with human behavior. For more information, see *Asian-American Studies.*

COURSES

Anthropology (Anth)

A. THE CORE CURRICULUM

I. BASICS.

Anth 1, 2 and 3 are taught each semester. Anth 15, 101 and 105 are taught once each year.

1. Introduction to Physical Anthropology (3). This course examines the biological basis of being human. It compares us with our primate relatives, traces the evolution of our species from 4 million-year-old australopithecines, and accounts for the great anatomical and biochemical diversity among modern human populations. General Education BREADTH, Division 3. (CAN ANTH 2)

2. Introduction to Cultural Anthropology (3). Not open to students with credit in Anth 15. This course examines the nature of culture, humanity's unique mechanism for adapting to the changing environment. It explores the varieties of human life and explains how culture has made possible the range of different and successful societies, from hunters and gatherers to industrial civilization. General Education BREADTH, Division 8. (CAN ANTH 4)

3. Introduction to Prehistory (3). An exploration of human prehistory as revealed by the archaeological record. This course traces the evolution of culture, from its earliest expression in crude stone tools more than 2 million years old, through the emergence of agriculture and the first civilizations. General Education BREADTH, Division 3. (CAN ANTH 6)

15. Man's Place in the Natural Environment (5). A special introduction, involving extended field trips, which integrates introductory cultural anthropology and archaeology to explain how past and present peoples have adapted to and altered biological and geological processes and features. Offered only in the fall as part of the 17-unit "Man and the Natural Environment" program which requires concurrent enrollment in Biol 15, Geol 15, and N Sci 15. General Education BREADTH, Division 8. (Field trip fees: $150)

30. Critical Thinking in Anthropology (3). Introduction to the basic concepts and skills of critical thinking illustrated with anthropological topics such as race and intelligence, religion and values, and social policy. General Education CORE, Critical Thinking.

101. Field Work in Anthropology (3). Prerequisite: Anth 106 or 108. An introduction to the role, the theory, and the rudimentary techniques of fieldwork in archaeology, and ethnology. Requires some field trips, including weekends.

II. METHOD AND THEORY.

These courses are offered once each year.

102. Introduction to Linguistic Anthropology (3). Prerequisite: Anth 1 or 2. A compendium of current thinking on language from a variety of interdisciplinary perspectives. Discusses brain functions and language process in human and non-human communication systems, and the roles of language in human evolution, behavior, and thought.

104. History and Theory of Anthropology (3). Prerequisite: Anth 2 or 105. A history of the growth of anthropological thought through an analysis of the informational and explanatory powers of five major theoretical schools: Nineteenth-century Evolutionists, British Functionalists, Boasian Historical Particularists, Neo-Evolutionists/Marxists, and Cognitivists.

105. Anthropology, Science and Society (3). Not open to students with credit in Anth 50. Prerequisite: Anth 1, 2, and 3, or permission. Science, like all human endeavors, exists within a cultural framework. This course analyzes the scientific community as a distinctive subculture, compares scientific worldview with those of traditional societies, and explores the cultural factors that influence how scientific inquiry is conducted. (Former Anth 50)

106. Contemporary Archaeology (3). Prerequisite: Anth 2, 3, or permission. An overview of the nature of archaeological data and its use in reconstructing the lifeways of prehistoric peoples. Special emphasis is given to the development of modern archaeological theory, the current state of the profession, and its present trends and limits.

108. Urban Anthropology (3). Prerequisite: Anth 2, 3, or permission. The uneven distribution and explosive growth of humanity during this century evolved a lifestyle whose implications are poorly understood: urban existence. The course reviews cross-cultural and interdisciplinary evidence and explanations for urbanization, with a focus on American life. General Education CAPSTONE Cluster, Critical Thinking.

B. THE ELECTIVE CURRICULUM

These courses are generally taught once every two years. Topics courses are offered irregularly.

III. AREA SURVEYS

121. Peoples and Cultures of South America (3). Prerequisite: Anth 2. A survey of South American Indian tribes and civilizations since prehistoric times, based on archaeological and ethnographic data. The course explores the interplay between environment and local cultural adaptations, and examines the effect of historical contact with European peoples.

123. Peoples and Cultures of Southeast Asia (3). Prerequisite: Anth 2. An introductory survey of the cultural and historical adaptations of societies in Burma, Thailand, Laos, Cambodia, and Vietnam; and of Insular societies in Indonesia, Malaysia, and the Philippines. Examines the major effects of culture contact between East and West. General Education CAPSTONE Cluster.

124. Peoples and Cultures of East Asia (3). Prerequisite: Anth 2. Examines cultural pluralism. Considers cultural adaptations and change among minorities such as Moslems, Tibetans, and Mongolians in China, and ethnic groups of Japan and Korea. Outlines kinship, religion, organization and technological factors in the Asiatic culture complex.

127. Peoples and Cultures of the Southwest (3). Prerequisite: Anth 2. A survey of Native American cultures of the Southwestern United States and Northwestern Mexico from their prehistoric origins to the present. Emphasis placed on cultural continuity and change during the past 400 years of contact with western culture.

129T. Topics in Area Surveys (1–3). Prerequisite: Anth 2. Special surveys of peoples and cultures in regions not covered in the regular curriculum, such as Africa, the Caribbean, or the Middle East.



IV. ARCHAEOLOGY

131. Prehistory of North America (3). Prerequisite: Anth 3. Traces the development of Native American cultures from the Arctic to Mesoamerica, from the peopling of the continent to early historic times. Examines the archaeological evidence for the antiquity, spread, and variation of cultural adaptations to changing ecological conditions.

132. Prehistoric Europe (3). Prerequisite: Anth 3. Outlines the peopling of the European continent, and the origin and spread of its cultures from Neanderthal times through the Middle Ages. The contributions of the Etruscans, Scythians, Slavs, Germanics, Celts, Vikings, Brits and others to the birth of history.

139T. Topics in Archaeology (1–3). Prerequisite: Varies with title. Special studies in archaeological methods, techniques, history and theory, or of prehistoric culture areas not covered in the regular curriculum.

V. SOCIAL ORGANIZATION

140. Organization and Inequality (3). Prerequisite: Anth 2. Examines cooperation, competition, dominance and predation in the division of labor and its rewards. Achievement and ascription of roles and statuses on the basis of sex, age, and perceived value in bands, tribes, feudal states, caste and class systems.

142. Anthropology of War (3). Prerequisite: Anth 2. An interdisciplinary analysis of the evolution of violence and aggression. The course examines theoretical explanations for warfare from biological determinism to elite predation, and indicates its costs and benefits to individual and group welfare at different stages of cultural complexity.

144W. Cultural Scenarios (3). Prerequisite: Engl 1, Anth 2 or 3, and at least 56 completed units. Using ethnological data, students reconstruct an extinct society's basic challenges, adaptations and collapse; derive the implications for the world today; and show what alternatives would have prolonged the viability of its culture. Designed for writers, planners and applied anthropologists. (Former Anth 144)

146. Law and Culture (3). A comparative, holistic perspective on the evolution of law. Examines its natures and origins, the basic assumptions behind legal systems, their cross-cultural expression and effects, and the directionality of legal evolution. General Education CAPSTONE Cluster, Critical Thinking.

149T. Topics in Social Organization (1–3). Prerequisite: Varies with title. Special studies in the theory and practice of organized cooperation and conflict in nature and culture.

VI. WORLD VIEW

150W. Anthropology of Religion (3). Prerequisite: Engl 1, Anth 2. Examines the patterned belief systems of the world's tribal, peasant, and sectarian societies. Stresses the role of religion in individual and group perception, cognition, ritual, and social organization. Topics include myth, magic, shamanism, mysticism, witchcraft, trance, hallucinogens, and cultism. Meets upper-division writing skills requirement for graduation. General Education CAPSTONE Cluster, Critical Thinking.

155. Folk Medicine (3). Prerequisite: Anth 2. A cross-cultural examination of health practices and of the cultural assumptions and attitudes on which they are based. Reviews ethnomedicine, ethnopsychiatry, and epidemiology in the health care systems of non-Westerners and of ethnic communities in pluralistic America.

159T. Topics in Ideology (1–3). Prerequisite: varies with title. Special studies on the form and function of ideology or of specific ideological systems, constructs, or practices.

VII. PHYSICAL ANTHROPOLOGY

161. Fossil Man (3). Prerequisite: Anth 1. A critical examination of the fossil evidence for hominid forms and behaviors in the Pliocene and Pleistocene epochs. The course focuses on the specific evolutionary factors which led to the emergence of modern humanity.

162. Primates (3). Prerequisite: Anth 1. An introduction to the study of primate biological and behavioral evolution. Explores sociobiological theory in order to explain the unity and diversity of social behavior in prosimians, monkeys, and apes.

163. Human Variation (3). Prerequisite: Anth 1. A cross-cultural examination of variations in human morphology, physiology, and biochemistry. Establishes the correlation between variations in human biology and variations in climate, culture, nutrition, and disease.

164. Human Osteology (3). Prerequisite: Anth 1. Introduces a range of analytic techniques for extracting information from human skeletal remains: sexing and aging, osteometry, odontometry, the examination and diagnosis of epigenetic traits and pathological lesion, and the statistical interpretation of skeletal data.

169T. Topics in Physical Anthropology (1–3). Prerequisite: Anth 1. Special studies of the discovery and interpretation of information in physical anthropology, and of the application of this subdiscipline in legal, medical, and scientific research.

VIII. SUBCULTURAL VARIATION

170. Women: Culture and Biology (3). (Same as W S 170.) Prerequisite: Anth 1 or 2. A cross-cultural and interdisciplinary analysis of the determinants of female statuses and circumstances. Examines theories, including biological and cultural determinism, which explain variations in the expression of sexuality, maturation, reproduction, and the life cycle. General Education CAPSTONE Cluster, Critical Thinking.

172. Ethnic Relations and Cultures (3). Prerequisite: Anth 2 or permission. The cultural and social origins of ethnicity, and its opportunities and problems for contemporary mass societies. The course offers a critical review of major theories on ethnic politics, economics, and ideology in the light of cross-cultural evidence. General Education CAPSTONE Cluster, Critical Thinking.

179T. Topics in Subcultural Variation (1–3). Prerequisite: varies with title. Special studies on the origin, evolution, manifestation and implication of subcultural differences in the modern world. Selected topics may include criminal, sexual, physically impaired, or institutional subcultures.

C. THE SPECIAL CURRICULUM

Courses in this division cover topics outside of the standard curriculum, including student research projects. Credit earned in these courses applies to the 124-unit university graduation requirement, but ordinarily may not be applied to the requirements for the anthropology major or minor.

IX. POPULAR ANTHROPOLOGY

181. Cultures and Foods of East Asia (3). (Same as AsAm 151.) Treats cuisine as a systematic product of the interaction between culture and ecology. Focuses on sociocultural rather than bio-nutritional factors in the preparation and ritual implications of food in Mainland and Insular Asia. (Students learn to prepare and serve a variety of Oriental dishes.)

186. Tradition and Change in China and Japan (3). (Same as HUM 140.) This course examines the current aspirations and problems of the Chinese and Japanese in terms of their traditional cultures, and explains how their histories, values, worldviews, and intellectual traditions affect their lifestyles and their international relations today. General Education CAPSTONE Cluster.

189T. Topics in Popular Anthropology (1–3). Anthropological approaches to topics of public interest, presented in a fashion which does not require the student to have previous experience in anthropology.

X. ADVANCED STUDY IN ANTHROPOLOGY

The following courses are normally open only to students who have completed the core curriculum.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

192. Directed Readings (1–3). Prerequisite: normally open only to students who have completed the core curriculum. Supervised reading on a student-selected topic outside the regular curriculum, conducted under regular consultation with a faculty sponsor.

199. Honors Thesis (1–3). Prerequisite: normally open only to those who have completed the core curriculum and who maintain a GPA in Anthropology of at least 3.5. Development of a student report or paper into a manuscript of professional and publishable quality. Requires approval by an Honors Committee of three faculty members.

Armenian Studies Program

School of Arts and Humanities
Department of Foreign Languages
Dickran Kouymjian, Haig and Isabel Berberian Professor of Armenian Studies, Coordinator
Peters Business Building, Room 384
(209) 278-2669

Minor in Armenian Studies



The Armenian Studies Program offers a wide variety of courses, including Armenian language, literature, history, art, film, the life and writings of William Saroyan, architecture, folk traditions, the Genocide and contemporary issues affecting the Armenian diaspora. It provides the only regularly-taught program in Armenian art with specialized courses in painting, architecture and the minor arts. Armenian course content is also available in the departments of foreign languages and history.

Although CSU, Fresno does not offer a bachelor's degree program in this field, by a careful selection of electives and requirements in various majors, students can secure a useful background for the understanding of the language, history, art and culture of one of the world's oldest peoples. A "special major" in Armenian Studies may be obtained with approval.

The minor offered in Armenian Studies, not only affords an excellent opportunity to gain an academic background on one of the important Middle Eastern minority groups in America but prepares students for teaching in Armenian schools in the United States, for administrative positions in an ever-increasing number of Armenian cultural, social and benevolent organizations, or for graduate work in Armenian doctoral programs at Harvard, Michigan, Columbia and UCLA.

Haig and Isabel Berberian Endowed Chair in Armenian Studies. In the fall of 1988, the Haig and Isabel Berberian Endowed Chair of Armenian Studies was established at CSUF. It is one of several Armenian chairs in the United States and provides financial support for a distinguished Armenologist. The endowment honors Haig and Isabel Berberian and was established by their son-in-law and daughter, Dr. and Mrs. Arnold H. Gazarian. Other friends of the Armenian Studies Program have made significant contributions to the endowment.

The Armenian Studies Program also supervises the Index of Armenian Art, a systematic computerized catalog of individual works of Armenian art which is accessible to students. The program, housed in the Center for Armenian Studies in the Leon S. Peters Building, sponsors and supports the Armenian Students Organization on campus and its newspaper *Hye Sharzhoom/Armenian Action*. The Sahatdjian Armenian Library and the Avedian Armenian Archives in the Center for Armenian Studies along with the Special Collections of the university library have a vast Saroyan archive and important collections of documents relating to the early history of Armenians in Fresno.

For students who need financial aid, the program provides a number of work-study jobs and administers the granting of more than 20 university scholarships for students with an interest in Armenian Studies, including the Charles K. Pategian Scholarships, the Knights of Vartan Scholarship and the Levonian Educational Grant.

Armenian Studies Minor

	Units
Arm 1A and 1B	8
Arm 2A or 2B or 111 and Arm S 120T	3–4
Arm S 10, Hist 108A or 108B	6
Arm 148 and Arm S 45 or 121 or 123 or 190	6
	23–24

COURSES

Armenian Studies (Arm S)

10. Introduction to Armenian Studies (3). The history, geography, literature, language and art of Armenia from ancient times to the present. General Education BREADTH, Division 9.

45. William Saroyan (3). The ethnic experience in America, especially the San Joaquin Valley, is examined through the writing of William Saroyan, who is among the most sensitive ethnic writers in American Literature. No prerequisites; writing assignments of at least 2,500 words. (Former Arm S 50T section)

50T. Studies in Armenian Literature (3). Various themes and aspects of Armenian literature: David of Sassoun, the Armenian Folk Epic; William Saroyan; Armenian Historical Literature; Modern Armenian Literature; Armenian World of Richard Hagopian; Armenian-American Authors.

120T. Topics in Armenian Studies (1–3; max total 6). Specialized topics in Armenian history, art and culture, not normally covered in other Armenian Studies courses. Topics include Armenian church, Armenian minor arts, Armenian film, the Armenian Diaspora, Armenian genocide and oral history.

121. Armenian Painting (3). History and development of Armenian painting with special concentration on the art of manuscript illumination; rudiments of early Christian iconography.

123. Armenian Architecture (3). History and development of the church building in Armenian architecture, the first national architecture in the history of Christianity. There will be a survey of monuments from the 4th to the 17th century.

190. Independent Study (1–3). See *Academic Placement — Independent Study*. Approved for *SP* grading.

Art

School of Arts and Humanities
Department of Art
Frank B. Laury, Chair
Conley Art Building, Room 105
(209) 278-2516

B.A. in Art
Minor in Art
M.A. in Art
Single Subject Credential



The Department of Art courses lead to a bachelor's degree with a major in art, a minor in art, a secondary single-subject waiver credential in art, and a master's degree with an emphasis in studio or art history.

The Art Department offers a program of study derived from an educational conviction that a foundation in the craft of art is an essential prerequisite to the production of works exhibiting sophistication both conceptually and visually.

Courses offered in history of art examine, identify, and appreciate the visual arts from prehistory to the present. This is implemented in a manner that reflects the department's commitment to a humanities perspective based on a belief in the fundamental unity of the arts and the ideas that give them form.

The studio classes offer a variety of contemporary and traditional areas of exploration. These areas of concentrated study lead toward skilled applications and projects that demonstrate proficiency in graphic experimentation and expression.

The variety of offerings in studio art, art education, and the history of art encourage individualized strategies for formulating coherent programs. This results in a unique opportunity for occupational preparation in a variety of careers in the visual arts.

Faculty and Facilities

The faculty of the department offers a diverse, skilled and professional approach to art education. The methods of teaching reflect distinctive yet complementary ways and means of introducing their disciplines while guiding the students through the program with a sense of dedication and commitment to the education of artists and scholars.

The facilities of the department not only include the requisite studios, labs, and support facilities, but include an art gallery, two new photography labs, a new printmaking studio, and a 78-seat lecture hall in a contemporary art building complex.

Career Opportunities

Completion of the art major enables graduates to pursue careers in fields such as:

- Fine Arts.
- Studio Production.
- Education in Art History and Studio.
- Craft Design and Fabrication.
- Applied Photography.
- Ceramics and Sculpture.
- Applied Design and Graphics.

Prospective students should contact advisers in their area of interest to further explore specific career opportunities.

Faculty

Frank B. Laury, *Chair*

Joyce B. Aiken
Lawrence L. Anderson
Richard W. Delaney
Ara H. Dolarian
Paulette S. Fleming
Charles F. Gaines
Norman H. Lockwood
Edward O. Lund
Mary L. Maughelli
Thomas McDougall
William E. Minschew, Jr.
Dan G. Nadaner
Ernest Palomino
Raphael X. Reichert
R. Gayle Smalley
Gina Strumwasser

Credential Program

The Single Subject Waiver Program in art consists of the Core: Art H 10, 11, Art 13, 21, 40, 50, 60, 70, 120, 140, Art H 130, and Art 150 or 160; Breadth: Art H 136, select three units from Art 24, 25, 26, 27, 30, or 80; select three units from Art 125, 127, 130, or 180; select three units from Art 113, 170, 171, or 175; select three units from Art H 134 or 170. Consult the departmental coordinator for teacher education.

Bachelor of Arts Degree Requirements

	Units
1. Major requirements (See Note 1):	42
a. Lower-division requirements:	(18)
Art H 10 and 11	(6)
Art 13	(3)
Art 20 or 40	(3)
Art Studio electives	(6)
b. Upper-division requirements:	(24)
Art H 136 and 3 additional Art H units	(6)
Art H and/or Studio electives	(6)
Art 101 and 112	(6)
Art Studio electives (one area)	(6)
2. General Education requirement	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a dual major or minor:	31–37*
Total	124

* This figure takes into consideration that a maximum of two General Education-BREADTH courses may also be applied to satisfy art major requirements (see *General Education*). These can be selected from Art H 10, 11, Art 1, 13, 20, 30, 40, 50, 60, and 70. Consult the art department chair or faculty for additional details.

Notes:

1. Students with a demonstrated interest in art history may, with the approval of the chair, take up to 24 upper-division units of art history toward the major. The remaining units must include Art 101 and additional courses taken from the department's studio offerings.
2. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy art major requirements.
3. *CR/NC* grading is only permitted in Art 198, Internship.
4. General Education and elective units may be used toward a dual major or minor (see *Dual Major* or departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.

Art Minor

The art minor consists of a minimum of 21 units of which 9 must be upper division.

	Units
Art H 10 and 11	6
Art 13 and 20	6
Art H elective (upper division)	3
Art H or Studio electives (upper division)	6
	21

Graduate Program

The graduate program for the Master of Arts degree in Art is based upon the equivalent of the undergraduate major in art at CSU, Fresno. The program provides specifically for certain nonvocational areas of interest; photography, crafts, design, drawing, painting, ceramics, sculpture, art history, and theory. With prior approval, programs with multiple concentrations may be arranged. For specific requirements consult the departmental graduate program director; for general requirements, see *Division of Graduate Studies and Research.*

The Master of Arts degree program in Art assumes preparation equivalent to the undergraduate major in art at CSU, Fresno. Applicants must first complete university requirements for admission to the Division of Graduate Studies and Research, including the Graduate Record Examination Aptitude Test. Applicants must also pass the Department of Art Classified Standing Screening Review.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements, and Criteria for Thesis and Project.*)

Graduate courses in art are open to holders of the B.A. degree in Art who have been conditionally classified by the Department of Art.

Second-semester seniors in the undergraduate art program may also enroll in 200 series coursework in art subject to the approval of the instructor.

Master of Arts Degree Requirements

Under the direction of a graduate adviser, each student prepares and submits a coherent program individually designed within the following framework:

	Units
Approved courses in art in the 200 series (See *specific requirements*)	18–30
Approved courses in art or related fields in the 100- or 200-series	0–12
Total	30

Specific Requirements: Art 230 or 260 (3 units) and Art 298 or 299 (2–6 units). Before being allowed to exhibit, candidates expecting to participate in Art 298 are required to have completed Art 112 or the equivalent approved by the gallery director.

For studio areas, additional units (3–9) in Art 240 or 220T are specifically recommended.

For art history areas, Art 230 and additional units (3–9) in Art 260 are specifically recommended.

Classified Standing: Concurrent with the departmental review and evaluation for classified standing, the student will submit a tentative program outline for approval by the screening committee.

Advancement to Candidacy: Prior to the completion of 20 units of the proposed program, the student will review the program of courses with an adviser from the selected area of concentration.

COURSES

Art History (Art H)

ART HISTORY SURVEYS

10. The Ancient and Primitive World (3). An introductory survey to the arts of the prehistoric and primitive realms, including Western traditions (Egyptian, Greek, Roman, Medieval) through the mid-fourteenth century. General Education BREADTH, Division 5. (CAN ART 2)

11. The Modern World (3). An introductory survey of Western art from the Renaissance through the 20th century, including Mannerism, Baroque, Rococo, and Neoclassicism from the mid-fourteenth century to the beginning of the 19th century. General Education BREADTH, Division 5. (Former Art H 20) (CAN ART 4)

109T. Topics in Art History (1–3; max 3 per area). Specific areas in art history not normally covered in the regular course offering. Possible topical areas include African, Pre-Columbian, Primitive, Early Migrations, American Indians, Buddhism, Chinese Painting, Happenings, History of Modern Art through Film, Museums and Monuments of Europe, Fountains of Baroque Rome, Popes and Patrons of Renaissance Europe, 17th century Holland and the Rise of the Secular in Art.

WESTERN ART SURVEYS

120. Italian Renaissance (3). Artistic revival of classical antiquity in Italy between 1300–1550. General Education CAPSTONE Cluster, Critical Thinking.

122. Northern Renaissance (3). Painting and sculpture from the Netherlands, France and Germany between 1300–1550. General Education CAPSTONE Cluster.

124. Italian Baroque (3). Baroque art from its conception in Rome to its dispersal throughout Italy from 1600–1750.

126. Northern Baroque (3). Diffusion of Italian Baroque art to the Netherlands, France, Spain, Germany, and Austria between 1600–1750.

130. Modern Painting: 19th–20th Century (3). Evolution of painting and sculpture in the nineteenth and twentieth centuries.

131. Nineteenth Century Modern Art (3). Not open to students in Art H 130. A comprehensive survey of the revolutionary art movements in a social context, including the contribution of major masters as exemplified by artists such as Toulouse-Lautrec, Vincent van Gogh, and Picasso.

132. Modern Art Before 1945 (3). A comprehensive survey of the revolutionary art movements in a social context including contributions of major masters.

134. America (3). Art from colonial times to 1945.

136. Contemporary Art Since 1945 (3). A comprehensive survey of contemporary movements from Abstract Expressionism through Post Modernism.

PRIMITIVE ART SURVEYS

160. Africa (3). Sculpture, painting, architecture, festivals and personal adornment of sub-Saharan Africa. Field trips may be required.

ART OF THE AMERICAS SURVEYS

170. North American Indian and Eskimo (3). Arts of the indigenous North American cultures from the Arctic to the American Southwest. Field trips may be required.

173. Pre-Columbian Mexico (3). Art of the Olmec through the Aztec cultures. Field trips may be required.

175. Pre-Columbian Andes (3). Art of the Chavin through the Inca cultures. Field trips may be required. General Education CAPSTONE Cluster, Critical Thinking.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

Studio (Art)

1. Art Forms (3). Slide lecture-discussion. An introduction to art/seeing and appreciating the visual world around us. General Education BREADTH, Division 5.

13. Design (3). Exploration of basic art concepts through two- and three-dimensional design problems. General Education BREADTH, Division 4. (6 lecture-lab hours)

20. Drawing (3). Introductory course in drawing concepts, materials and techniques. General Education BREADTH, Division 4. (6 lecture-lab hours) (CAN ART 8)

21. Figure Drawing (3). Introductory course in the basic concepts of figure drawing problems and techniques. (6 lecture-lab hours)

24. Printmaking (3). Introduction to the printmaking processes of intaglio, lithography, and woodblock printing. (Course fee, $10) (6 lecture-lab hours)

25. Lithography (3). Studio class offering in printing of drawings created on stone, and metal plates in the planographic process. Printing in black ink as well as color will be covered. (Course fee, $10) (6 lecture-lab hours)

26. Intaglio Processes (3). Studio class offering in printing in the intaglio process using such techniques as etching, drypoint, aquatint, and softground on metal plates. Printing in black ink as well as color will be covered. (Course fee, $10) (6 lecture-lab hours)

27. Screenprinting (3). Investigation into techniques of printing with a screen. Paper, film, tusche, and glue techniques for creating printing stencils will be covered. (Course fee, $15) (6 lecture-lab hours)

30. Photography (3). Introductory course in black and white photography. Basic theoretical and practical aspects of the photographic process relevant to the medium as an art form. General Education BREADTH, Division 4. (2 lecture, 3 lab hours)

40. Painting (3). Introduction to painting processes through studio problems and critiques. General Education BREADTH, Division 4. (6 lecture-lab hours)

45. Watercolor (3). Introduction to techniques in watercolor painting with emphasis on transparencies. (6 lecture-lab hours)

50. Sculpture (3). Introductory course in materials and concepts. General Education BREADTH, Division 4. (6 lecture-lab hours) (CAN ART 12)

60. Beginning Ceramics (3). A survey of ceramic materials and their functions in the arts. Basic studio practices in the handbuilding processes, glazing, and throwing on the potter's wheel. General Education BREADTH, Division 4. (Course fee, $15) (6 lecture-lab hours)

70. Crafts (3). Fundamental exploration of several media (fiber, wood, leather) with emphasis on understanding the potential of the various materials. General Education BREADTH, Division 4. (6 lecture-lab hours)

80. Introduction to 35mm Photography (3). Introductory course in the creative and practical aspects of small format black and white photography. Emphasis on individual assistance and guidance in the craft and technique of interpreting, photographing, and printing a range of assignments that form the term portfolio. (Course fee, $20) (2 lecture, 3 lab hours)

100T. Topics in Art (1–3; max total 3 per area). Specific lecture area not normally covered in regular course offerings or in art history. Topics may include but are not limited to: African-American art, Chicano art, cinema art, urban aesthetics, formalism in art, economics of art, careers in art, portfolio preparation.

101. Content and Form (3). The concept of form in art and its effects upon content, style, materials, and techniques through studio problems and critiques. (6 lecture-lab hours)

102. Philosophies of the Visual Arts (3). Visual representation of past and present art movements.

103. Guest Artists (3; max total 9). Seminar with experienced guest artists.

104. Feminist Art (3; max total 6). (Same as W S 124.) Prerequisite: permission of instructor. Multimedia art in varied forms. Creation of images based on women's unique experiences and feelings leading to the exhibition of work made in class. Exposure to art and lives of women artists; development of awareness of female heritage in arts. (6 lecture-lab hours).

106. Art Tours (3; max total see below). Prerequisite: permission of instructor. May be repeated for credit; no more than 6 units may be applied on the art major. Directed trips to galleries, museums and other places of interest to the student of art; half of the semester devoted to studio projects, half to out-of-town tours; assigned papers, studio projects, discussion. (Course fee for chartered travel costs, $140) (6 lecture-lab hours)

109T. Topics in Studio Art (1–3; max total 3 per area). Prerequisite: permission of instructor. Specific advanced studio processes not normally covered in regular course offerings. Areas offered may be drawing, painting, ceramics, sculpture, photography, printmaking, design, crafts, motion-picture, art education, computer graphics. (Computer graphics course fee, $20) (6 lecture-lab hours)

112. Gallery Techniques (3; max total 9). Introduction to museum practices related to exhibition selection, design, and installation techniques. Field trips, lectures, projects, and critiques. (6 lecture-lab hours)

113. Design (3; max total 9). Prerequisite: Art 13. Continuation of the exploration of two- and three-dimensional design problems. (6 lecture-lab hours)

115. Calligraphy (3; max total 9). The art of written forms with emphasis upon the cursive and calligraphic modes of formal italic handwriting associated with contemporary Western cultures. Introduction to the use, care and construction of calligraphic tools. Development of composition, color and aesthetic interpretation. (6 lecture-lab hours)

116. Interaction of Color (3). Interaction of color as developed by Joseph Albers; basic design principles in connection with color work. (6 lecture-lab hours)

Good teaching is a talent, like fine painting and beautiful music. Some people can learn to do it well, and some can't.

Charlotte Hiatt
Professor, Information Systems and Decision Sciences

120. Drawing (3; max total 9). Prerequisite: Art 20. Investigation of advanced concepts through the techniques of the drawing medium. (6 lecture-lab hours)

121. Figure Drawing (3; max total 9). Prerequisite: Art 21. The human figure and its relevancy to advanced drawing concepts and techniques, emphasis on individual exploration in studio problems. (6 lecture-lab hours)

125. Lithography (3; max total 9). Prerequisite: Art 24 or 25. Studio class designed for advanced work in stone and metal plate printing in both black as well as color inks. Emphasis placed on imagery development. (Course fee, $10) (6 lecture-lab hours)

126. Intaglio Processes (3; max total 9). Prerequisite: Art 24 or 26. Studio class designed to offer advanced work in intaglio printing processes such as etching, engraving, drypoint, aquatint, mezzotint, color, photoengraving, inkless intaglio, viscosity printing. Emphasis placed on imagery development. (Course fee, $10) (6 lecture-lab hours)

127. Screenprinting (3; max total 9). Prerequisite: Art 27. Investigation into techniques of screenprinting. Paper, film, tusche, glue, and photo techniques for creating printing stencils will be covered. Emphasis placed on imagery development. (Course fee, $15) (6 lecture-lab hours)

130. Photography (3; max total 9). Prerequisite: Art 30. Advanced photography. Possible emphasis: black and white, color, history and appreciation, and individual production. (6 lecture-lab hours)

133. Alternative Imagery in Photography (3; max total 9). Prerequisite: Art 30. Approaches to non-traditional photography. Emphasis on producing personal imagery. (6 lecture-lab hours)

140. Intermediate Painting (3). Prerequisite: Art 40. Individual investigation of advanced aesthetic concepts; continued search into personal direction. (6 lecture-lab hours)

141. Advanced Painting (3; max total 9). Prerequisite: Art 140. Designed primarily for students with two or more semesters of experience in painting. Emphasis on individual involvement in the painting process aiming toward advanced formal and technical expression. (6 lecture-lab hours)

142. Mixed Media (3; max total 9). Prerequisite: permission of instructor. Collage, transfer, assemblage, experimental techniques. (6 lecture-lab hours)

145. Watercolor (3; max total 9). Prerequisite: Art 45. Painting with emphasis on transparencies. (6 lecture-lab hours)

150. Sculpture (3; max total 9). Prerequisite: Art 50. Individual investigation in use of materials (such as clay, plaster, metal and wood) and techniques as applied to aesthetic concepts. (6 lecture-lab hours)

151. Sculpture: Metal Casting (3; max total 9). Prerequisite: Art 50. Continued investigation of concepts in sculpture with an emphasis on casting. (Course fee, $25) (6 lecture-lab hours)

160. Intermediate Ceramics (3; max total 9). Prerequisite: Art 60. Emphasis will be on promoting a greater awareness of form as developed on the potter's wheel. A concentrated study of surface treatments and their integration with clay forms. (Course fee, $15) (6 lecture-lab hours)

161. Advanced Ceramics (3; max total 9). Prequisite: Art 160. Advanced study in ceramic art. Individual projects in selected ceramic areas with emphasis on showing and portfolio presentation of work. (Course fee, $15) (6 lecture-lab hours)

165. Ceramic Glazes (3; max total 9). Prerequisite: Art 160, permission of instructor. Concentrated study in glazes through the empirical methods with some discussion on historical and technical integration of glazes with clay forms. (Course fee, $25) (6 lecture-lab hours)

170. Crafts (3; max total 9). Prerequisite: Art 70. Advanced design in a variety of materials. Study of contemporary designer craftsmen. (6 lecture-lab hours)

171. Textile Design: Dyeing and Printing (3; max total 9). Design relating to fabrics, tie dye, batik, and silk screen. (Course fee, $15) (6 lecture-lab hours)

175. Metal Design (3; max total 12). Exploration of basic techniques (forging and fabrication) of working with copper and brass (silver optional) to create small objects and/or articles of adornment. Design and craftsmanship will be emphasized. Tool kits and most materials are provided. (Course fee, $20) (6 lecture-lab hours)

179. Development of Artistic Expression (3; max total 9). Art materials and techniques, as they apply to the elementary school curriculum; introduction to current philosophies in art education, theories of the development phases of artistic expression in children. (Course fee, $15) (6 lecture-lab hours)

180. Advanced 35mm Photography (3; max total 6). Prerequisite: permission of instructor. Emphasis on the formulation and execution of individual thematic photographic projects. Supplemental assignments that explore optical and chemical methods of image modification. Continuation and elaboration of applied compositional design. Introduction to interactive critique and evaluation of photographic prints and projects. (Course fee, $20) (2 lecture, 3 lab hours) (Former Art 180A)

182. Introduction to Large Format Photography (3; max total 12). Prerequisite: permission of instructor. Introduction to the unique aspects of the large format camera and its creative application in field assignments. Emphasis on individual assistance in both field and laboratory work. Introduction to selective exposure and development control, optical effects, and applied compositional design. (Course fee, $20) (2 lecture, 3 lab hours)

183. Field Studies in Photography (3; max total 12). Prerequisite: permission of instructor. Individual guidance in the formulation of exploratory multi-image photographic essays produced on location. Emphasis on forming individual conceptual goals and acquiring communicative skills appropriate to the medium. Introduction to photographic theory and its practical application to individual creative objectives. (Course fee, $20) (2 lecture, 3 lab hours)

185. Color Photography (3; max total 12). Prerequisite: permission of instructor. Introduction to the unique attributes of color in the design and production of photographic prints. Multiformat color printing. Emphasis on directed exploration of color both conventional and experimental. Monochromatic and multichrome printing utilizing the camera and other printmaking sources. (Course fee, $20) (2 lecture, 3 lab hours)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

198. Internship in Art (1–6; max total 6). Prerequisite: permission of instructor and sponsoring agency. Experience in art related professions with agency under art department supervision. Maximum credit toward an art major, 6 units. *CR/NC* grading only. (minimum of 3 field hours per unit)

GRADUATE COURSES

(See *Course Numbering System.*)

220T. Topics in Studio Processes (3; max total 9). Prerequisite: permission of instructor. Investigation of advanced studio topics selected by the department. Coursework includes studio productions, their critiques and evaluations.

230. Seminar in Art Theory (3; max total 9). Prerequisite: permission of instructor. Theories of the visual arts as developed by artists, critics, and philosophers, and their application to art criticism in our time. Oral presentation and defense of critical papers required. Meets graduate writing skills requirement.

240. Seminar in Art Studio (3; max total 15, max 9 in one area). Prerequisite: permission of instructor. Work individually with selected staff in chosen area of concentration. Concurrent obligation to meet regularly scheduled seminars for group progress reports and critiques.

260. Seminar in Art History (3; max total 9). Prerequisite: 6 units of upper-division art history and permission of instructor. Research problems applicable to art history students or studio artists. Meets graduate writing skills requirement.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

298. Project (2–6; max total 6). Prerequisite: permission of art department graduate coordinator. (See *Criteria for Thesis and Project.*) Preparation, production, design, and installation of original works produced while engaged in the graduate program. Exhibit committee must approve of the work, location, and quality of installation. Abstract required. Approved for *SP* grading.

299. Thesis (2–6; max total 6). Prerequisite: permission of art department graduate coordinator; see *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE *(Art)*

(See *Course Numbering Systems.*)

343. Contemporary Approaches in Art (1–3; repeatable for credit). Advanced processes not normally offered in regular courses. Areas may include art education, drawing, painting, ceramics, sculpture, photography, printmaking, design, crafts and motion picture.

Asian-American Studies

School of Social Sciences
Department of Anthropology
Franklin C. L. Ng, Coordinator
Peters Business Building, Room 389
(209) 278-3002

Minor in Asian Studies

Asian-Americans constitute one of the fastest growing minority populations in California and the United States. A diverse group, Asian-Americans trace cultural heritages from nations as varied as China, Japan, Korea, the Philippines, India, and, most recently, Vietnam, Laos and Cambodia. The Asian-American Studies Program provides students with an opportunity to learn about the cultural richness of the American past and the variety in its ethnic mosaic. The oldest theme in American history has been immigration, and knowledge of Asian-Americans promotes an awareness and appreciation for cultural pluralism and multiculturalism within the United States.

The Program

The Asian-American Studies Program offers classes that focus upon the history and contemporary experience of Asians in the United States. These courses explore themes in local and ethnic history, trans-Pacific contact, cultural change and adaptation, and inter-ethnic relations. Those who major in business, social science, international relations and the human service professions recognize their relevance.

The Asian-American Studies Program does not offer a major, but a minor is available for those who wish to develop a special expertise in this subject.

Asian-American Organizations

The Asian-American clubs on campus welcome new members. These organizations include the Pilipino Club, the Vietnamese Club, the Hmong Student Association and the Amerasia Club which presents an annual campus program highlighting Asian-American communities and cultures in California.

For further information about the Asian-American Studies Program, please contact the coordinator at (209) 278-3002, or write to: Asian-American Studies Program, c/o Department of Anthropology, California State University, Fresno; Fresno, CA 93740.

Minor

The following minor requirements must include at least 9 upper-division units.

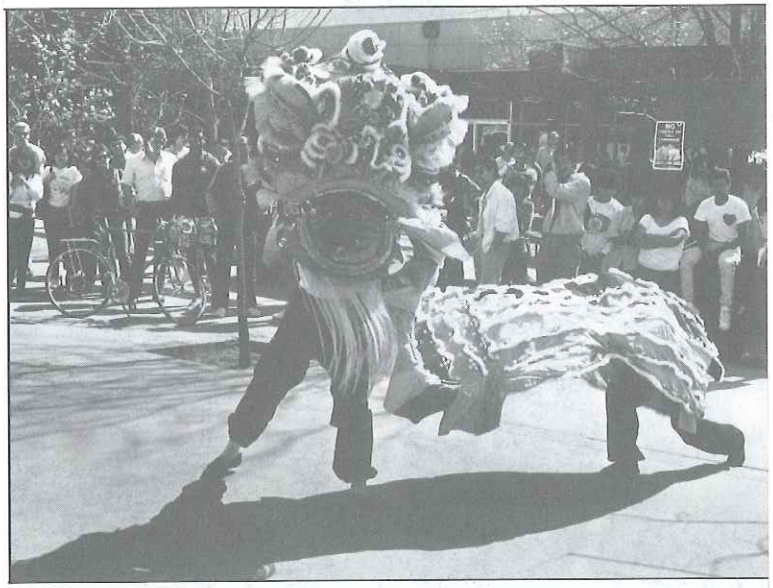
	Units
Elect from Anth 2, AsAm 110, Eth S 1	6
Elect from AsAm 15, 30, 56	6
Elect from AsAm 150, 180T, Anth 123, 124	9
Total	21

COURSES

Asian-American Studies (AsAm)

15. Introduction to Asian-American Status and Identity (3). Historical, social and psychological factors in the changing status and identity of Americans from Asia. The course examines variables such as cultural heritage, family organization, intergenerational conflict and the experience of racism in the changing world of Asian-Americans. General Education BREADTH, Division 9.

30. Japanese-Americans in the United States (3). A survey of social adaptations and cultural changes among Japanese Americans in different communities such as California and Hawaii. The course considers identity, marginality, acculturation, and cultural traditions in Japan and in American communities. General Education BREADTH, Division 9.



56. Chinese-Americans in the United States (3). A survey of social adaptations and cultural changes among Chinese Americans in such places as California, Hawaii and New York. The course considers identity, marginality, acculturation, and cultural traditions in China and in American communities. General Education BREADTH, Division 9.

110. Asian-American Communities (3). A multidisciplinary study of Asian-American communities and their relations with the larger society. Analyzes values, life styles, processes of group identity and boundary maintenance, social organization and cultural change. Examination of Chinese, Japanese, Pilipino and other Asian-American subcultures. General Education CAPSTONE Cluster.

150. Asian-American Expression (3). The study of Asian and Asian-American literature, art, music and drama. Examines the role of creative expression as a way of understanding changing views of ethnicity and community identity.

151. Cultures and Foods of East Asia (3). (See Anth 181.)

180T. Topics in Asian-American Studies (3; max total 6). Prerequisite: AsAm 15, permission of instructor. Detailed consideration of a single topic concerning the past or present position of Asian-Americans in U.S. society.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

Athletics

School of Health and Social Work
Department of Athletics
Gary A. Cunningham, Chair
North Gym, Room 146
(209) 278-2643



California State University, Fresno is a Division I–A member of the National Collegiate Athletic Association and the Big West Conference. Participation in intercollegiate athletics in the sports of baseball, basketball, cross country, football, golf, soccer, swimming, tennis, track, water polo and wrestling is offered for men, while basketball, cross country, softball, swimming/diving, tennis, track and field, and volleyball are offered for women. Participation offers opportunities for student athletes to pursue and improve their athletic talent under a professional coaching staff, experience disciplined team membership, travel with their team to away contests, and excel to the height of their ability.

Activities

Students majoring in physical education may count a maximum of 12 units of dance technique, physical education and athletic activity courses toward the total units required for the bachelor's degree; other students may apply a maximum of 8 units to the total degree requirement.

Faculty

Gary A. Cunningham, *Chair*

Bob G. Bennett
John R. Bluem
Gary W. Colson
Dennis A. DeLiddo
William E. Dole
John W. Easterbrook
Jose A. Elgorriaga
Gene L. Estes
Edward L. Ferreira
Robert E. Fraley
Irene Harris
Keri Hauschildt
Lawrence P. Hill
Clifford W. Hysell
Robert G. Knudsen
Teri McKeever
John Miklesh
Tom Milich
Diane Milutinovich
Steve Mooshagian
Richard W. Olson
Leilani Overstreet
Thomas J. Pagani
Roberto Parker
William J. Robinson
Michael L. Rupcich
Paul M. Schechter
Robert L. Spencer
Bradley C. Stine
James J. Sweeney
L. Michael Watney
Marjorie A. Wright

COURSES

Athletics (ATHL)

10. Strategies for Academic Success (3). Restricted to intercollegiate athletes. Designed to help entering students make a smooth transition into the university, as well as increase knowledge of policies, procedures, resources and graduation requirements especially pertaining to student athletes. Introduces techniques to improve learning strategies and provides students with awareness about relevant drug and health issues. *CR/NC* grading only. (Former ATHL 1R)

INTERCOLLEGIATE (Courses may be repeated)

*** 100. Conditioning of Athletes (1)**
176. Baseball (2). Men only.
177. Basketball (2). Men only.
178. Basketball (2). Women only.
180. Cross Country (2).
182. Football (2).
183. Golf (2).
186. Soccer (2).
187. Softball (2). Women only.
188. Swimming (2). Men only.
189. Swimming (2). Women only.
191. Tennis (2). Men only.
192. Tennis (2). Women only.
193. Track and Field (2).
196. Volleyball (2).
197. Water Polo (2).
199. Wrestling (2).

* Prerequisite for Athletics 100: Must be enrolled in a varsity team sport (Athletics 176–199)

Biology

School of Natural Sciences
Department of Biology
Ronald L. Evans, Chair
Science Building, Room 106
(209) 278-2001

B.A. in Biology
Options:
Biological Science
Botany
Environmental Biology
Functional Biology
Microbiology
Zoology

B.S. in Microbiology

Minor in Biology

M.A. in Biology
M.S. in Marine Sciences

Single Subject Teaching Credential in Life Science
Preprofessional advising in:
Medicine
Dentistry
Pharmacy
Veterinary Medicine
Forestry
Clinical Laboratory Technology

The Department of Biology offers a diversified program of courses with two baccalaureate degree programs: a Bachelor of Arts in Biology with six options and a Bachelor of Science in Microbiology. The biology options in the B.A. degree provide for careers in teaching, agriculture-related disciplines and research, as well as preparation for advanced degrees.

Biology students may also obtain preprofessional preparation for study in medicine, nursing, dentistry, veterinary medicine and other health science fields. The B.S. in Microbiology, while especially appropriate for students wishing to enter the field of clinical laboratory technology, can also lead to careers in other areas of microbiology. In addition to courses offered at CSU, Fresno, courses and research experiences obtained at the Moss Landing Marine Laboratories on Monterey Bay may be applicable to Department of Biology degree programs.

Faculty advising plays a major role in helping students plan their academic programs. Consult with the department chair for adviser assignment. See your adviser at least once a semester for assistance in selecting a degree program and courses. Students intending to transfer from community colleges may also wish to consult an adviser. These students should complete most of their lower-division General Education, major and additional requirements prior to transferring to CSU, Fresno.

Faculty and Facilities

The faculty of the Department of Biology obtained their doctorates in a wide range of biological disciplines. The laboratories accompanying most upper-division courses in the department are taught by faculty, allowing the students to work closely with their professors. Student participation in faculty research is encouraged.

The department is housed in a well-equipped, modern facility. Scientific equipment routinely used in undergraduate instruction includes two electron microscopes, ultracentrifuges, scintillation counters, spectrophotometers and computers. Greenhouse and animal-care facilities provide additional support to the instructional programs. Field courses take full advantage of Fresno's central location with trips to the Sierra Nevada and the Pacific coast.



Faculty

Ronald L. Evans, *Chair*

Raymond Abhold	Howard L. Latimer
Gina Arce	Thomas E. Mallory
Donald J. Burdick	Jerrome Mangan
David L. Chesemore	J. Robert McClintic
S. Fai Cheuk	Fred E. Schreiber
William K. Collin	Richard A. Spieler
Stephen H. Ervin	Bert A. Tribbey
David E. Grubbs	Vivian A. Vidoli
Richard Haas	Lorraine Wiley
Ethelynda E. Harding	Keith H. Woodwick
Wallace M. Harmon	In-Soon You
Shirley A. Kovacs	Lenore Yousef

Graduate Coordinator: Stephen H. Ervin
Moss Landing Marine Laboratories' Coordinator: Keith H. Woodwick
Credential Adviser: (To be appointed)
Undergraduate advisers are assigned by the department chair.

Bachelor of Arts Degree Requirements

Biology Major

The biology major consists of 40–41 units, depending upon which of the six options is selected. A minimum of 24 units of major coursework must be upper division. To complete this major, students must complete the biology core, one of the options described below, and additional requirements in related fields as specified in each of the options.

BIOLOGY CORE (See Note 1 at end of Bachelor of Arts description) *Units*

Bot 1, Zool 1, Biol 130, 135, 140 ..... *15–17

* Biol 130 is not required in the microbiology option.

Options

Biological Science. This degree program is intended for students who wish to explore the breadth of biology. Within this option students take courses in microbiology, botany, physiology, entomology and zoology, as well as courses in biology which do not emphasize any particular taxonomic group. This option is recommended for students planning entry into secondary school teaching and other careers requiring a broad coverage of biology. With the selection of appropriate elective courses, students may prepare themselves for entry into graduate and professional schools.

Students must include a minimum of 6 upper-division Bot and 6 upper-division Zool-Ent-Phy units. *Units*

I. Option requirements 40
  A. Biology Core (See Note 1 at end of Bachelor of Arts description) ..... (17)
  B. Micro 20 or 104 ..... (4–5)
  C. Select a minimum of one course from each of the following categories:
    1. Biol 125, 133; Bot 107; Zool 138, 175; M Sci 103 ..... (3–4)
    2. Biol 160, 175; Bot 104, 137; Ent 110; Phy 140; Micro 161, 189; M Sci 123 ..... (3–4)
    3. Bot 106, 134, 135, 136; Ent 101; Zool 103, 108, 113, 114; M Sci 112, 113, 124, 131 ..... (3–4)
  D. Biological Science electives ..... (6–10)
II. Additional requirements 21–23
  Chem 3A, 8, 150 ..... (10)
  Math 70 or 71–72 or 75 ..... (4–6)
  Math 101 or Psych 42 ..... (4)
  C Sci 101 ..... (3)
III. Remaining General Education requirements 42*
IV. Electives and remaining degree requirements (see *Degree Requirements*); may include a minor 19–21

Total 124

* Nine units of General Education requirements are satisfied to the following extent by major and additional requirements: CORE, Category 3 by Math 70, 72, or 75; Psych 42; BREADTH, Division 1 by Chem 3A, Division 2 by Bot 1 or Zool 1. Consult your major academic adviser for details.

Botany. This program is designed to serve students who are interested in pursuing career or graduate education opportunities in the area of plant biology. Morphological, ecological, taxonomic and physiological aspects of plants are emphasized in this degree program. This preparation is consistent with the requisites of careers in environmental fields, both governmental and private, and in agriculture-related areas. The central location of Fresno, between the coast and the mountains, affords a unique opportunity for students to explore the diverse flora of California. The department has excellent facilities for both field and laboratory study in botany. The department greenhouse facility houses a unique collection of plants, both native and foreign to California. *Units*

I. Option requirements 40
  A. Biology Core (See Note 1 at end of Bachelor of Arts description) ..... (17)
  B. Bot 104 ..... (4)
  C. Select a minimum of one course from each category:
    1. Bot 106, 107 ..... (3–4)
    2. Bot 134, 136, 137 ..... (3–4)
    3. Bot 135, 142; M Sci 131 ..... (3–4)
  D. Upper-division electives selected from Biol, Micro, Zool-Ent-Phy courses ..... (6)
  E. Additional Botany electives ..... (1–4)
II. Additional requirements 21–23
  Chem 3A, 8, 150 ..... (10)
  Math 70 or 71–72 or 75 ..... (4–6)
  Math 101 or Psych 42 ..... (4)
  C Sci 101 ..... (3)
III. Remaining General Education requirements 42*
IV. Electives and remaining degree requirements (see *Degree Requirements*); may include a minor 19–21

Total 124

* Nine units of General Education requirements are satisfied to the following extent by major and additional requirements: CORE, Category 3 by Math 70, 72, or 75; Psych 42; BREADTH, Division 1 by Chem 3A, Division 2 by Bot 1 or Zool 1. Consult your major academic adviser for details.

Environmental Biology. This major is intended for those students who are interested in a field program in the biological sciences. The integration of the courses in this program provide students in-depth instruction in theoretical and applied ecology, both plant and animal, in fisheries, wildlife management, aquatic and terrestrial ecology, and in conjunction with the Moss Landing Marine Laboratories, marine ecology. Sufficient morphologic and taxonomic background is provided in the areas of

entomology, invertebrate zoology, vertebrate zoology and botany. Students completing this option are well prepared for entry into careers in governmental field research (local, state and federal agencies), in agriculture-related areas, environmental law, and into advanced study programs leading to graduate degrees. With selection of appropriate optional courses, students may secure an emphasis in marine sciences.

	Units
I. Option requirements	40
A. Biology Core (See Note 1 at end of Bachelor of Arts description)	(17)
B. Select a minimum of one course from two of the following categories:	(7–8)
1. Bot 106, 142; M Sci 131	
2. Ent 101; Zool 114; M Sci 124	
3. Zool 103, 113; M Sci 112, 113	
C. Select a minimum of one course from two of the following categories:	(6–7)
1. Biol 133; Zool 136; M Sci 103, 144, 161	
2. Bot 107	
3. Zool 134, 138	
D. Select one course from: Bot 104; Phy 140; Micro 20, 104; M Sci 123	(4–5)
E. Additional Biological Science electives	(3–6)
II. Additional requirements	24–27
Chem 3A, 8, 150	(10)
Math 70 or 71–72 or 75	(4–6)
Math 101 or Psych 42	(4)
C Sci 101	(3)
A minimum of one course from C Sci 20; Phys 2A; M Sci 142, 143; Geol 1, 105; SI 101	(3–4)
III. Remaining General Education requirements	42*
IV. Electives and remaining degree requirements (see *Degree Requirements*); may include a minor	15–18
Total	124

* Nine units of General Education requirements are satisfied to the following extent by major and additional requirements: **CORE,** Category 3 by Math 70, 72, or 75; Psych 42; **BREADTH,** Division 1 by Chem 3A, Division 2 by Bot 1 or Zool 1. Consult your major academic adviser for details.

Functional Biology. This degree option focuses on the areas of biology which interface closely with chemistry, including cell and molecular biology, genetics, and physiology. Students interested in preprofessional training in medicine often select this option. Students completing this degree program typically continue their education in professional or graduate schools in pursuit of advanced degrees.

	Units
I. Option requirements	40
A. Biology Core (See Note 1 at end of Bachelor of Arts description)	(17)
B. Select at least two courses from Biol 160, 175; Micro 104, 189	(7–9)
C. Select at least two courses from Bot 104; Ent 110; Phy 140; Micro 161; M Sci 123	(7–8)
D. Additional Biological Science electives	(6–9)
II. Additional requirements	44–47
Chem 1A–B, 128A–B, 129A or 109, 105, 150 or 155	(25–26)
Phys 2A–B	(8)
Math 70 or 71–72 or 75	(4–6)
Math 101 or Psych 42	(4)
C Sci 101	(3)
III. Remaining General Education requirements	42*
IV. Electives and remaining degree requirements (see *Degree Requirements*)	0
Total	126–129

* Nine units of General Education requirements are satisfied to the following extent by major and additional requirements: **CORE,** Category 3 by Math 70, 72, or 75; Psych 42; **BREADTH,** Division 1 by Chem 1A or 1B, Division 2 by Bot 1 or Zool 1. Consult your major academic adviser for details.

Microbiology. This option is intended as an alternative for students who have interests in areas of microbiology other than those included in the microbiology, B.S. degree program. In particular, medical microbiology is not emphasized as in the B.S. degree program, although students may elect courses in this area as elective choices. Core courses in biology, microbiology and chemistry provide a firm basis for advanced study in microbiology and molecular biology. Students may specialize in applied aspects of the field, including environmental and industrial microbiology and medical technology with selection of appropriate option elective courses. Students completing this option are prepared for careers in a variety of fields and for entry into graduate study in microbiology and molecular biology. Graduates in this option are eligible for certification by examination as registered microbiologists through the American Society for Microbiology.

	Units
I. Option requirements	41
A. Biology Core (See Note 1 at end of Bachelor of Arts description)	(15)
B. Micro 104, 125, 161, 189	(17)
C. Select two courses from Bot 142; Ent 107; H S 109; Micro 117, 118, 130, 150, 185; Zool 107, 108, 115, 158	(6–10)
D. Select at least one upper-division biology course other than those listed above	(3–4)
II. Additional requirements	42–44
Chem 1A–B, 8, 105, 109, 150 or 155	(23)
Phys 2A–B	(8)
Math 70 or 71–72 or 75	(4–6)
Math 101 or Psych 42	(4)
C Sci 101	(3)
III. Remaining General Education requirements	42*
IV. Electives and remaining degree requirements (see *Degree Requirements*)	0
Total	125–127

* Nine units of General Education requirements are satisfied to the following extent by major and additional requirements: **CORE,** category 3 by Math 70, 72, or 75; Psych 42; **BREADTH,** Division 1 by Chem 1A or 1B, Division 2 by Bot 1 or Zool 1. Consult your major academic adviser for details.

Zoology. This degree program is intended to serve students who are interested in pursuing career or graduate education opportunities in the area of animal biology. Morphological, ecological, taxonomic and physiological aspects of animals (vertebrates and invertebrates) are emphasized in the various courses comprising this option. The department has excellent teaching collections of preserved animals which are used effectively in the teaching program. Students interested in field studies have excellent opportunities within this program. With selection of appropriate optional courses, the student may obtain an emphasis in entomology in this degree option.

	Units
I. Option requirements	40
A. Biology core (See Note 1 at end of Bachelor of Arts description)	(17)
B. Select a minimum of one course from each of the following categories:	
1. Ent 110; Phy 140; M Sci 123	(3–4)
2. Ent 101; Zool 108, 114; M Sci 124	(3–4)
3. Zool 103, 113, 160	(4)
C. Upper-division electives selected from Biol, Micro, or Bot courses	(6)
D. Additional Zool-Ent-Phy electives	(5–7)
II. Additional requirements	21–23
Chem 3A, 8, 150	(10)
Math 70 or 71–72, or 75	(4–6)
Math 101 or Psych 42	(4)
C Sci 101	(3)
III. Remaining General Education requirements	42*
IV. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a minor	19–21
Total	124

* Nine units of General Education requirements are satisfied to the following extent by major and additional requirements: **CORE,** Category 3 by Math 70, 72, or 75; Psych 42; **BREADTH,** Division 1 by Chem 3A; Division 2 by Bot 1 or Zool 1. Consult your major academic adviser for details.

Notes for all Bachelor of Arts in Biology options:

1. B.A. Biology majors who have taken introductory sequences other than Bot 1 or Zool 1 must consult with the department chair or faculty adviser for equivalency evaluation prior to beginning their upper-division coursework. Biol 130 is not required in the Microbiology option.
2. Chem 1A–B may be taken as a substitute for Chem 3A–4 and Chem 128A–B may substitute for Chem 8. The reverse substitutions are not permissible. Premedical students should take Chem 1A–B and 128A–B instead of Chem 3A and 8.
3. B.A. Biology majors selecting the Functional Biology and Microbiology options will complete a minor in Chemistry and should request the minor on their application for graduation. Consult the chemistry department chair for details (see *Chemistry Minor*).
4. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy Biology major requirements.
5. *CR/NC* grading is not permitted in the Biology major.
6. General Education, additional and elective requirements may be used toward a dual major or minor (see *Dual Major,* or departmental *minor*). Consult the appropriate department chair, program coordinator, or faculty adviser for additional information.

Suggested Sequence of Courses for Bachelor of Arts Degree Major

In addition to courses required for the major, General Education requirements and electives should be included to bring total to 15–17 units per semester. A total of 124 units must be included for the Bachelor of Arts degree. Electives may include minor and credential requirements. (See *Degrees and Credentials.*)

During the first two years, students should attempt to complete most general education requirements; the constitution and government requirements; Zool 1 and Bot 1; and all additional lower-division requirements in the option they have selected. Biol 130, 135, 140, and Math 101 or Psych 42 should be completed as early as possible after becoming eligible to receive upper-division credit, preferably no later than the end of the third year. The remainder of the third and fourth years should be spent completing requirements for the selected option, and electives in biology and other fields.

Bachelor of Science Degree Requirements

Microbiology Major

The Bachelor of Science degree in Microbiology is offered for students preparing for careers in microbiology and laboratory technology, especially clinical laboratory technology. This degree requires 127 units. With judicious selection of electives, this major may also serve as preparation for graduate study and public health or industrial microbiology careers. Such careers would include the fermentation industries, pollution control, food technology, biologics production and others.

	Units
I. Major requirements	38
Micro 104, 117, 118, 150, 185	(22)
Phy 65	(5)
Zool 1, 107, 158	(11)
II. Additional requirements	32
Bot 10	(3)
Chem 3A, 4, 8, 105, 109, 150, 151, 153, 154	(26)
Phys 125	(3)
III. Remaining General Education requirements	45*
IV. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a minor	12
Total	127

* Six units of General Education requirements are satisfied to the following extent by major and additional requirements: **BREADTH,** Division 1 by Chem 3A; Division 2 by Bot 10 or Zool 1. Consult your major academic adviser for details.

Notes for the Bachelor of Science in Microbiology major:

1. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy Microbiology major requirements.
2. *CR/NC* grading is not permitted in the B.S. Microbiology major.
3. General Education, additional, and elective requirements may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.
4. B.S. Microbiology majors will complete a minor in chemistry and should request the minor on their application for graduation. Consult the chemistry department chair for details (see *Chemistry Minor*).

Suggested Sequence of Courses for Bachelor of Science Degree Major

1st year:	Bot 10; Zool 1; Chem 3A, 4
2nd year:	Chem 8, 105, 109; Micro 104; Phy 65
3rd year:	Micro 117; Phys 125; Zool 107, 158
4th year:	Micro 118, 150, 185; Chem 150, 151, 153, 154

Biology Minor

The biology minor consists of a minimum of 20 units of which 12 must be upper division.

	Units
Bot 10 and Zool 10 or equivalents	6–10
An approved field course (see below)	3–4
Biol 130 or Micro 104; Biol 135, 140	7–10
Biology electives (upper division)	0–4
	20

Approved Field Courses: Biol 133; Bot 106, 107; Ent 101; Zool 113, 114, 134, 135, 137, 138, 140, 165.

Credential Program

The single subject waiver program for Life Science (Biology) consists of Bot 1; Zool 1; Biol 125, 130, 135, 140; Micro 20 or 104; Chem 3A, 8, 150; Geol 1 or 2; Phys 2A–B; C Sci 101 and one course from each of the following: (1) Bot 106, 107; (2) Biol 133; Ent 101; Zool 113, 114; (3) Bot 104; Phy 65, 140.

For program planning in science, consult the biology departmental coordinator for teacher education each semester.

Graduate Programs

The Master of Arts in Biology degree program is designed to extend competence for biological research, biological field work, the teaching of biological science and to provide a basis for advanced graduate study at a university offering the doctoral degree.

The Master of Science in Marine Sciences degree program provides a practical and theoretical education for marine specialists, scientists and teachers planning to enter marine-related careers or fields of study. This program provides extensive field and laboratory work by taking full advantage of Moss Landing Marine Laboratories' unique location which allows immediate access to deep water over the Monterey Submarine Canyon, to Elkhorn Slough and to a wide range of ocean and coastal environments. Students will be exposed to interdepartmental work and a field facility for advanced study in the marine sciences which would be impossible to duplicate at the home campus of CSU, Fresno.

Admission to a graduate program in the biology department requires attainment of classified graduate standing by satisfaction of biology department classification procedures. Unclassified postbaccalaureate standing allows students to pursue coursework objectives but does not constitute admission to graduate curricula. Attainment of classified standing constitutes formal admission to the program. Classification procedures vary with each biology department program and are listed below.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Project.*)

Master of Arts Degree Requirements

Biology Major

The Master of Arts in Biology degree program assumes preparation equivalent to a CSU, Fresno undergraduate major in biology. Students having undergraduate majors in fields other than the biological sciences may enter the program, but may reasonably expect additional requirements to produce equivalent preparation. Academic breadth in the biological sciences is assumed to be part of the student's undergraduate preparation.

After obtaining a list of specific departmental requirements from the graduate coordinator of the biology department, the student, under the direction of a graduate adviser, prepares and submits a coherent program individually designed within the following framework:

	Units
Courses in 200-series (See *specific requirements*)	15
Electives	15
Total (at least 18 units in biological sciences)	30

Specific Requirements: Biol 299. Other courses will be specified upon examination of the student's record and in accordance with the recommendation of the advisory committee.

Admission to classified graduate standing must be recommended by the graduate committee of the biology department. The recommendation will be based upon a classification score which combines GRE scores and undergraduate GPA and is computed in the following manner.

Classification Score = (GPA × 40)
+ (GRE Biology %ile × 2)
+ GRE Verbal %ile
+ GRE Quantitative %ile

Percentiles are based upon norms established by the Educational Testing Service and in effect at the time the test was taken. Prior to the 8th week of the semester, students should meet with the graduate coordinator to discuss the graduate committee's decision. Students are assigned to one of the following three categories.

1. *Classified Graduate Standing:* Students having a classification score of 340 or better are automatically recommended for classified graduate standing.
2. *Conditional Classified Standing:* Students having a classification score between 260 and 339 are recommended for conditional classified standing. This does not constitute classification but indicates that additional specific requirements must be completed to achieve classified standing.
3. *Unclassified Postbaccalaureate Standing:* Students scoring below 260 are assigned unclassified status and should seek counseling from the department graduate coordinator.

Master of Science Degree Requirements

Marine Sciences Major

This degree program, to be offered as an interdepartmental degree (biology, geology or other appropriate department) in cooperation with Moss Landing Marine Laboratories (MLML) provides the opportunity for students to acquire a practical and theoretical education in the marine sciences to prepare them for careers as marine specialists, scientists and teachers. The program at Moss Landing provides extensive field and laboratory work for advanced study in the marine sciences, which is not duplicated on individual California State University consortium campuses.

Admission to the Program

The Master of Science in Marine Sciences degree program is administered through MLML and a consortium campus, with emphasis on biology, geology or other department, depending on the choice of the student. The prospective student must meet the entrance requirements for the department and will be accepted into unclassified or conditionally classified graduate status by normal procedures at that campus. The student will become classified upon completion of MLML's requirements.

Classification (MLML) in the Program

A conditionally classified student may become fully classified in the marine sciences program as set forth in the following steps:

1. Obtain an adviser at MLML (may or may not be the final thesis adviser) and one from the science department at the home campus.
2. Make up any coursework deficiencies in the home campus department and/or MLML.
3. M Sci 104 Quantitative Marine Science, and three of the following five core courses are prerequisites for classified graduate standing: M Sci 103 Marine Ecology, M Sci 141 Geological Oceanography, M Sci 142 Physical Oceanography, M Sci 143 Chemical Oceanography, and M Sci 144 Biological Oceanography. These courses may be waived by the graduate committee upon certification that equivalent courses have been satisfactorily completed. M Sci 104 Quantitative Marine Science is not counted toward the 30-unit degree requirement.
4. A written qualifying examination is required of all students for classification except those who have taken the core courses at MLML and passed with *B* or better grades.

Advancement to Candidacy

In order to be advanced to candidacy, the student must have:

1. Attained classified standing.
2. Completed writing skills requirement (according to home campus requirements).
3. Selected a thesis problem and a thesis advisory committee. The thesis committee is composed of at least three members, including one faculty member from MLML (who is ordinarily the thesis adviser) and, at the discretion of the home campus, a representative from that campus. The other member or members of the thesis committee may be from MLML, the home campus, or elsewhere, with the approval of the thesis adviser.

Degree Requirements Including Coursework

A student becomes eligible for the master's degree in marine sciences after the following requirements have been satisfied:

	Units
Courses in 100-series (requires any three of the following five courses: M Sci 103, M Sci 141, M Sci 142, M Sci 143, M Sci 144	12
Courses in 200-series (including 2 units of M Sci 285T, 286T or 287T, and 4 units of M Sci 299)	15
Electives (course(s) in the 100 and/or 200-series) approved by thesis committee	3
Total	30

Prerequisite requirement for classified graduate status:

M Sci 104 (no credit on contract)

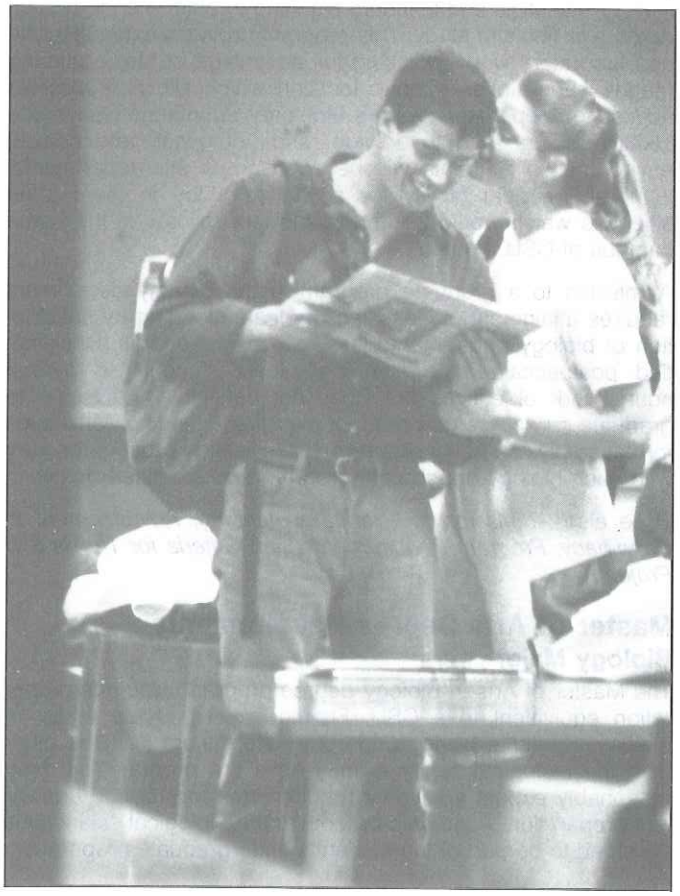
1. The student must have submitted a thesis approved by the thesis advisory committee. The thesis must conform to the rules set forth by the home campus graduate office.
2. The student must successfully give an oral thesis defense in the form of a seminar open to the general public. The thesis advisory committee must be present, may require further oral questioning after the seminar and evaluates the success of the presentation.

Biotechnology Certificate Program

California State University, Fresno has initiated a Certificate of Advanced Study Program in Biotechnology. This intensive one-year postbaccalaureate program emphasizes Molecular Biology and a wide range of laboratory skills at the forefront of modern biotechnology. The biotechnology field is growing rapidly and, as new products and applications are commercialized, there is increased need for highly-skilled personnel capable of working in both research and production areas. Enrollment is limited to 12 to 15 students per year who work closely with faculty in a variety of lecture and laboratory courses. Among the techniques studied are purification of biological macromolecules, gene splicing, DNA sequencing, culturing of mammalian cells, hybridoma production, and plant cell culturing and cloning.

The Certificate Program can lead to potential careers in expanding fields, such as drug and hormone production in the pharmaceutical industry, monoclonal antibody production for medical diagnostics, crop improvement, industrial bioprocessing and medical research. The program also provides a background for further postgraduate studies in fields such as Biochemistry, Molecular Biology and Agricultural Biotechnology. Some of the courses may also be used at CSUF as components of Master's Degree Programs in Biology, Chemistry, Plant Science and related departments.

Courses include: Molecular Biology (Biol/Chem 241A-B), Techniques in Protein Purification (Biol/Chem 242), Nucleic Acid Technology Lab (Biol/Chem 243), Cell Culture/Hybridoma Laboratory (Biol/Chem 244), Micropropagation (Plant Science 102), and Seminar in Molecular Biology/Biotechnology (Biol/Chem 248).



COURSES

Biology (Biol)

10. Life Science (3). Not open to students with credit in Bot 1 or Zool 1. Principles of biology related to the cell, maintenance, and relation of living organisms, heredity and elementary processes of evolution, and basic principles of ecology. General Education BREADTH, Division 2. (2 lecture, 2 lab hours)

15. An Ecological Approach to Life Science (5). Concurrent Enrollment in Anth 15, Geol 15, N Sci 15 required. Portion of *Man and the Natural Environment* Cluster. An introduction to biological concepts and investigational methods in the natural environment. Lecture, lab, and field work. General Education BREADTH, Division 2. (Field trip fee is required.) (See *Man and the Natural Environment,* School of Natural Sciences page.)

101. Nature Study (3). Not allowable for credit for biological or physical science majors or minors. Prerequisite: lower-division biology, botany, or zoology. Evaluation of natural science programs at the elementary level; optional opportunities in developing K-9 environmental study material or designing environmental awareness topics for adult groups; emphasis on life science programs dealing with the interaction of man and the biosphere. (2 lecture, 3 lab hours)

102W. The Scientific Paper (3). No credit toward biological or physical science majors or minors permitted. Prerequisite: Engl 1. An introduction to the preparation, structure, use and writing of the scientific research article; the meaning, logic and structure of the abstract, introduction (historical review), methods, results, discussion, conclusion and bibliographic citation. Meets the upper division writing skills requirement for graduation.

105. Human Ecology (3). Not open to students with credit in Biol 20. The study of the relationships between humans and their environment, both natural and man-made; emphasis on scientific understanding of root causes of current environmental problems. General Education CAPSTONE Cluster.

107. Heredity and Society (3). Prerequisite: college biology, zoology or botany. Principles of genetics and evolution as they apply to human society, thought, experience and affairs. Ethical, social, political and medical problems in relation to genetic engineering and other techniques.

120. Introduction to Genetics (3). Not open to biology majors and students with credit in Biol 135. Prerequisite: college zoology or botany. Principles of biological inheritance, including gene structure, gene function, statistical methods, problem solving and human genetics.

122. Fundamentals of Human Genetics (3). Prerequisite: college biology, zoology or botany. Intended primarily for students in the health fields or biology. Meiosis, mitosis, chromosomes and genes. Mutations and familial diseases. Pedigrees, inbreeding, multiple genes, sex determination, blood group alleles, linkage and mapping, twins, cytogenetic and other diseases, genetic counseling.

125. Evolution (3). Biol 120 or 135 recommended. Evolutionary processes and patterns. (2 lecture, 1 discussion hour)

130. Introduction to Cell Biology (2). Prerequisite: Bot 1, Zool 1 and organic chemistry. Principles of cell biology at the molecular, cell organelle and whole cell level. Includes material related to both procaryotic and eucaryotic cells.

133. Aquatic Ecology (4). Prerequisite: Biol 140. Physical-chemical features of inland waters as related to their biology; community structure and function, ecological interactions, adaptations and identification of aquatic organisms. (2 lecture, 6 lab or field hours, including weekend field trips*[1])

135. Genetics (3). Not open to students with credit in Biol 120. Required of all biology majors. Prerequisite: Biol 130 or Micro 104. The mechanisms of inheritance. Modes of transmission of genetic material, linkage and recombination, sex determination, chromosome aberrations, immunogenetics, developmental genetics and population genetics.

140. Introduction to Ecology (2). Prerequisite: Bot 1 and Zool 1. Major concepts related to structure, function, organization and regulation at the population, community and ecosystem levels.

150. Electron Microscopy (4). Prerequisite: permission of instructor. Preparation and examination of biological specimens. Basics of electron microscopy and interpretation of electronmicrograms. (1 lecture, 9 lab hours)

155. Marine Biology (3). Prerequisite: college biology, botany or zoology. Introduction to the marine environment with emphasis on the biological aspects; systematics, ecology, and morphological and physiological adaptations of marine organisms, especially intertidal and shallow water forms; pollution; utilization of marine resources. (One field trip required)

157. Conservation of Natural Resources (3). (Same as T Ed 157.) Prerequisite: biological and physical science. Problems in conservation of natural resources in the United States; water supply, soils, minerals, metals, petroleum, natural gas, grasslands, forests, fisheries, wildlife and recreational areas; local, state, and national plans and organizations for conservation; educational implications and techniques.

160. Developmental Biology (3). Prerequisite: Biol 130, 135. Investigations concerning the variety of mechanisms acting during the several stages of development of the living organism, from gamete formation to morphological and biochemical differentiation of organ systems; emphasis on differential genetic control.

162. Biological Methods and Techniques (3). Open to credential candidates in the life science or physical science waiver program; course meets the professional education requirement of 30 units for the clear credential. Collection and preparation of biological materials and specimens for instruction. Designing and conducting laboratory investigations. Planning and directing field trips. (1 lecture, 6 lab hours)

175. Advanced Cell Biology (4). Prerequisite: Biol 130, 135 and organic chemistry. Advanced topics in cell biology, including cellular and molecular aspects of the following: muscle and non-muscle motility, membranes and cell surfaces, excitable cells and abnormal cells. Laboratory will emphasize molecular biological techniques. (3 lecture, 3 lab hours)

185T. Topics in Biology (1–4; max total 6). Prerequisite: permission of instructor. Investigation of selected areas in the field of biology. (Lecture and/or Laboratory)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

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* Late afternoon, Saturday and/or overnight field trips may be required.

GRADUATE COURSES *(Biol)*

(See *Course Numbering System.*)

200. Principles and Great Experiments in Biology (2). Development and influence of current biological thought.

204. Biology of Speciation (2). Prerequisite: Biol 135 and an evolution course. Evolution of the species as a unit of biological organization.

206. Biological Systematics (2). Prerequisite: at least one upper-division or graduate course having a phylogenetic component. Classification, nomenclature and taxonomic theory as applied to living organisms, their evolution and phylogeny.

207. Radiotracer Methodology in the Natural Sciences (3). (Same as Chem 207 and Phys 207.) Prerequisite: graduate standing; two semesters undergraduate physics recommended. For students in biology, chemistry, physics or other areas using radioisotopes. Covers radiation detection, radiation safety, gamma ray spectroscopy, liquid scintillation, radioimmunoassay and biological applications in living systems. (2 lecture, 3 lab hours) Team taught. (Former N Sci 207)

208. Biological Field Studies (1–6; max total 6). Prerequisite: permission of instructor. Integrated studies or specialized topics, including botanical, environmental, microbiological or zoological field studies.* Approved for *SP* grading.

210. Parasitic Protozoa (3). Prerequisite: Zool 108. A systematic survey of parasitic protozoa. (2 lecture, 3 lab hours)

212. Helminthology (3). Prerequisite: Zool 108. A systematic survey of parasitic helminths. (2 lecture, 3 lab hours)

225. Insect Taxonomy (2; max total 4). Prerequisite: Ent 101, 115. Identification and classification of major and specific groups of family and generic status. (6 lab hours)

238. Biological Membranes: Structure and Function (3). Prerequisite: a cellular biology course or biochemistry course. A study of the myriad of functions membranes perform with an emphasis on membrane transport. General structural properties of membranes, including fluidity and asymmetry, and modification of structural building blocks which lead to membrane diversity. (Former Biol 265T section)

240. Systems Ecology (3). Prerequisite: Biol 140, Math 70. Quantitative approach to the analysis of whole ecosystems including data acquisition and statistical treatment, conceptual and mathematical ecosystem modeling, and computer simulations in FORTRAN or BASIC. No programming experience needed. (2 lecture, 3 lab hours)

241A–B. Molecular Biology I–II (3–3). (Same as Chem 241A–B.) Prerequisite: Biol 135, Chem 150 or 155, and permission of instructor. Biol/Chem 241A is prerequisite for Biol/Chem 241B. Seminar covering current topics in molecular biology. Topics include: protein and nucleic acid structure, DNA replication, transcription, translation, bacterial and animal viruses, prokaryotic and eukaryotic regulation, mechanisms of exchange of genetic material, and recombinant DNA technology.

242. Techniques in Protein Purification and Analysis (3). (Same as Chem 242.) Corequisite: Biol/Chem 241A. Deals with the technologies relevant to protein isolation, purification, analysis, immobilization, and modification in micro and macro quantities. (1 lecture, 6 lab hours)

243. Nucleic Acid Technology Lab (3). (Same as Chem 243.) Prerequisite: Biol/Chem 241A and 242. Corequisite: Biol/Chem 241B. A lecture/laboratory course focusing on the technologies used in nucleic acid chemistry, specifically synthesis, translation, mutagenesis and genetic engineering. (1 lecture, 6 lab hours)

244. Cell Culture and Hybridoma (2). (Same as Chem 244.) Prerequisite: Micro 117 or 185. The theory and practice of in vitro propagation of eukaryotic cells, including growth characteristics, metabolic requirements and genetic analysis. Cloning, fusion and generation of monoclonal antibody (hybridoma) are presented relative to cultured cell biology and application to biotechnology. (1 lecture, 3 lab hours)

248. Seminar in Molecular Biology and Biotechnology (1–2, max. 4). (Same as Chem 248.) Prerequisite: admission into the Biotechnology Certificate Program. Reviews and reports on current literature in various aspects of Biotechnology and Molecular Biology.

250. Scientific Research Reporting (2). Prerequisite: permission of instructor. Techniques of scientific drawing and writing, illustrating emphasized. (1 lecture, 3 lab hours)

255T. Topics in Botany (1–3; max total 8). Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or Laboratory)

260T. Topics in Biology (1–3; max total 8). Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or Laboratory)

265T. Topics in Physiology (1–3; max total 8). Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or Laboratory)

270T. Topics in Zoology (1–3; max total 8). Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or Laboratory)

272. Physiological Ecology of Vertebrates (2). Prerequisite: Biol 140, Phy 140. An analysis of problems in and adaptations to arctic, alpine, marine, desert, tropical and disturbed ecosystems; matters of energy and water economy, respiratory, circulatory and sensory neuromuscular adaptations, and such topics as biological timing, migration and navigation. (Lecture/seminar: paper(s) required)

274. Biometry (3). Prerequisite: one statistics class, preferably Math 101. Application of statistical techniques to biological problems with emphasis on sampling, analysis of variance, experimental design, and regression techniques. Emphasis on analysis of real biological data and interpretation of results.

275. Zoogeography (3). Prerequisite: Zool 113 or permission of instructor. Seminar in descriptive and ecological geography of animal groups.

280. Practicum in Life Science Education (2; max total 4). Concurrent enrollment in T Ed 155B required. Application of life science teaching methodology, principles, and practices in middle and secondary school teaching; classroom/lab/field organization and management; measurement and evaluation instruments; inventory/requisition systems. Course meets the professional education requirement of 30 units for the clear credential.

* Late afternoon, Saturday and/or overnight field trips may be required.

281T. Seminar in Biological Science (1–2). Prerequisite: permission of instructor. Reviews and reports on current literature in the various phases of biology.

282. Biology Colloquium (1; max total 2). Experience in evaluation and critique of research presentations of students, faculty, and other scientists. Student must attend a minimum of ten approved research-oriented colloquia and participate in discussions and/or submit written reports.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

295. Research (2–6; max total 6). Prerequisite: permission of the instructor. Independent research by the advanced graduate student.

299. Thesis (2–4; max total 4). Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System*.)

302T. Topics in Biology (3; max total 6). Prerequisite: graduate standing or permission of instructor. Relation of man to his surroundings; review of concepts, cell, physics and chemistry of life, energetics, inheritance, evolution.

COURSES

Botany (Bot)

1. General Botany (5). No credit if taken after a course that has college botany as a prerequisite. Students with credit in Bot 10 receive only 2 units of credit. Prerequisite to most upper-division botany courses. Fundamentals of structure and function in seed plants; survey of plant kingdom. General Education BREADTH, Division 2. (3 lecture, 6 lab hours)

10. Plant Biology (3). Not open to students with credit in Bot 1. Structure, function, and development of plants. General Education BREADTH, Division 2. (2 lecture, 2 lab hours)

104. Plant Physiology (4). Prerequisite: college botany, Chem 1A or 3A; organic chemistry recommended. General metabolism and related processes. (2 lecture, 6 lab hours)

106. Plant Taxonomy (4). Prerequisite: college botany. Principles of plant classification; local flora. (1 lecture, 9 lab or field hours*)

107. Plant Ecology (3). Prerequisite: college botany. Interrelations of plants and environment. (2 lecture, 3 lab or field hours*)

134. Plant Anatomy (3). Prerequisite: college botany. Structure and development of flowering plants at the cellular and tissue levels. (2 lecture, 3 lab hours)

135. Nonvascular Plants (3). Prerequisite: college botany. Comparative structure and phylogeny of the fungi, algae, mosses, and liverworts. (2 lecture, 3 lab hours)

136. Vascular Plants (4). Prerequisite: college botany. Morphology, reproduction, and evolution of the major groups of vascular plants (both living and extinct). Emphasis placed upon the seed plants. (2 lecture, 6 lab hours)

137. Plant Growth and Development (3). Prerequisite: college botany. Processes involved in plant growth with emphasis on the development of form in higher plants and the experimental approach. (2 lecture, 3 lab hours)

142. Algology (4). Prerequisite: college botany. Morphology, cytology, ecology, physiology, economic importance and cultivation of the algae. (2 lecture, 6 lab or field hours*)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

200. Series. Graduate courses are listed under *Biology*.

Entomology (Ent)

101. General Entomology (3). Prerequisite: college zoology or one year of biology. Anatomy, physiology, life history, and classification of insects and other arthropods. (2 lecture, 3 lab or field hours*)

106. Economic Entomology (3) (Same as Pl Pr 103). Prerequisite: Bot 10 or Zool 10. General and economic entomology; taxonomy of the principal orders of insects; life histories, habits, recognition, and control of the principal agriculture insect pests of the San Joaquin Valley. (2 lecture, 3 lab hours)

107. Medical Entomology (4). Arthropod-borne diseases of man and animals and arthropod vectors of the diseases. (3 lecture, 3 lab hours)

110. Insect Physiology (3). Prerequisite: Ent 101. Principles of physiology as applied to insects; functions of insect body, tissues, and organs. (2 lecture, 3 lab or demonstration hours)

115. Insect Morphology (4). Prerequisite: Ent 101. Comparative study of the form and structure of insects; external and internal anatomy. (2 lecture, 6 lab hours)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

200 Series. Graduate courses are listed under *Biology*.

Microbiology (Micro)

20. Introductory Microbiology (4). Not open to students with credit in Micro 104. Prerequisite: Chem 3A, 3B, plus a college course in the biological sciences. Introduction to microbiology; principles and selected applications. (3 lecture, 3 lab hours)

104. Microbiology (5). Prerequisite: organic chemistry; Bot 1 or 10. Emphasis on prokaryotes (bacteria); microbial physiology, genetics, ecology, classification and identification; applications of microbiology. Prerequisite to other upper-division microbiology courses. (3 lecture, 6 lab hours)

117. Immunology (4). Prerequisite: Micro 104. Biol 135 recommended. Innate and specific immune, including both cell-mediated and humoral phenomena; illustration of principles and technique development in the laboratory. (2 lecture, 6 lab hours)

118. Bacteriology of Human Disease (5). Prerequisite: Micro 104; Micro 117 recommended. Bacterial, etiological agents of human disease. (3 lecture, 6 lab hours)

* Late afternoon, Saturday and/or overnight field trips may be required.

125. Microbial Ecology (4). Prerequisite: Biol 140 and Micro 104. Physiological ecology of microorganisms; interactions of microorganisms with abiotic and biotic factors in the environment; microbial habitats including soil, water, and organisms; techniques of microbial ecology (field and laboratory). (3 lecture, 3 lab hours*[2])

130. Industrial Microbiology (3). Prerequisite: Micro 20. A study of the useful activities of microorganisms with special emphasis on fermentative processes, production of biologics, waste disposal, food processing, and single cell food sources. (2 lecture, 3 lab hours*)

150. Medical Mycology (4). Prerequisite: Micro 104; Micro 117 recommended. Morphology, physiology, and principles of pathogenicity of selected fungal agents of human and animal disease. (2 lecture, 6 lab hours).

160T. Topics in Microbiology (1–4; max total 4). Prerequisite: permission of instructor. Investigation of selected areas in microbiology. (Lecture and/or Laboratory)

161. Microbial Physiology (4). Prerequisite: Micro 104. Structure, function, energy metabolism, growth and regulatory mechanisms of microorganisms. (2 lecture, 6 lab hours)

185. Virology (4). Prerequisite: Micro 104; Micro 117 recommended. Inquiries into the unique nature of viruses; methods of analysis, structure, and replication. Virus-host interactions are described from bacterial, plant, and animal virus groups. Considerable emphasis is placed on diagnosis of viruses infecting humans including epidemiology and viropathology. (2 lecture, 6 lab hours)

189. Microbial Genetics (4). Prerequisite: an introductory microbiology laboratory course, and Biol 135. The nature of genetic information, its mutation, transfer, and recombination in microbial cells. (2 lecture hours, 6 lab hours)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

GRADUATE COURSES *(Micro)*

(See *Course Numbering Systems*.)

256. Bacterial Diversity (3). Prerequisite: Micro 161. Physiology, ecology, isolation and culture of metabolically and morphologically diverse bacteria. Term paper and research project required. (2 lecture, 3 lab hours)

260T. Topics in Microbiology (1–3; max total 8). Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or Laboratory).

281T. Seminar in Microbiology (1–2). Prerequisite: permission of instructor. Reviews and reports on current literature in the various phases of microbiology.

290. Independent Study (1–3; max total see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

295. Research (2–6; max total 6). Prerequisite: permission of the instructor. Independent research by the advanced graduate student.

* Late afternoon, Saturday and/or overnight field trips may be required.

Physiology (Phy)

33. Human Anatomy and Physiology (5). Not open to students with credit in either a human anatomy or human physiology course. An integrated study of the structure and function of the human body. (4 lecture, 3 lab hours)

64. Functional Human Anatomy (3). Not open to students with credit in Phy 33. Primarily for students in the health related and biological professions. The life continuum from conception to death. A systems approach to the gross and microscopic structures of the human body. (2 lecture, 3 lab hours)

65. Human Physiology (5). Not open to students with credit in Phy 33. College chemistry and human anatomy recommended. Homeostasis in the human body; how organ systems function to maintain life; dynamic and adaptive systems at the molecular, cellular and organ level. (4 lecture, 3 lab hours)

140. Comparative Animal Physiology (4). Prerequisite: Biol 130 and organic chemistry. Evolution of physiological systems; functional adaptations to different environments; physiological principles as applied to animals. (3 lecture, 3 lab hours)

155. Neuroanatomy (4). Prerequisite: Anatomy and Physiology. Macroscopic and microscopic study of the structure and functional relationships of the mammalian nervous system. (3 lecture, 3 lab hours)

160. Neurophysiology (3). Prerequisite: Phy 155. Function of the nervous and muscular systems with emphasis on molecular mechanisms.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

200 Series. Graduate courses are listed under *Biology*.

Zoology (Zool)

1. General Zoology (5). No credit if taken after a course that has college zoology as a prerequisite. Students with credit in Zool 10 receive only 2 units of credit. Prerequisite to most upper-division courses in zoology. Systematics, general ecology, and phylogeny of major animal groups, including comparative studies of vertebrates and a general integration of biological principles. General Education BREADTH, Division 2. (3 lecture, 6 lab hours)

10. Animal Biology (3). Not open to students with credit in Zool 1. Structural and functional comparison of animals; principles and human implications of inheritance, evolution, and ecology; physiology as applied to man. General Education BREADTH, Division 2. (2 lecture, 2 lab hours)

103. Comparative Vertebrate Anatomy (4). Prerequisite: college zoology. Comparative structure of vertebrate organ systems; laboratory study of representative vertebrates. (2 lecture, 6 lab hours)

107. Medical Parasitology (3). Prerequisite: college zoology. Epidemiology, pathogenesis and identification of the parasites of man. (2 lecture, 3 lab hours)

108. Parasitology (4). Prerequisite: college zoology; general chemistry. A study of the general biology of symbiotic organisms of animal hosts including man. Lecture topics include life histories, epidemiology, infection and disease processes, physiology, and treatment. Laboratory exercises include a study of biological processes as well as parasite identification and diagnosis. (3 lecture, 3 lab hours)

113. Natural History of Vertebrates (4). Prerequisite: Biol 140. Systematics, distribution, morphology, behavior and ecology of fish, amphibians, reptiles, birds and mammals. Field work includes capture and sampling techniques, species identification and habitat analysis, and may require weekend field trips to coastal, desert and mountain environments. (3 lecture, 3 lab or field hours*)

114. Invertebrate Zoology (3). Prerequisite: college zoology. Systematics, general ecology, and phylogeny of free living invertebrates (excluding insects), and including field studies of marine intertidal habitats. (2 lecture, 3 lab or field hours*)

115. Protozoology (3). Prerequisite: Biol 130, 140. The biology of protozoan organisms. (2 lecture, 3 lab hours)

130. Animal Behavior (3). Prerequisite: Biol 140; recommended, one course in ecology or natural history. Principles of ethology with emphasis on mechanisms of behavior. (2 lecture, 3 lab hours*)

134. Wildlife Management (4). Prerequisite: Biol 140. Ecological theory and its use in the management of wildlife resources. Field and laboratory exercises designed for the application of techniques used in research and in making management decisions. (2 lecture, 6 lab or field hours*)

135. Mammalogy (3). Prerequisite: Biol 140. Ecology, evolution and diversity of the mammals of the world. (2 lecture, 3 lab or field hours*)

136. Fisheries Biology and Management (3). Prerequisite: Biol 140; statistics strongly recommended. Ecology and management of fishes; techniques for studying fish populations; quantitative methods for assessing fish stocks; environmental requirements and habitat improvement methods; acquisition and application of information to obtain maximum benefit from fishery resources. Inland fisheries emphasized. (2 lecture, 3 lab or field hours*)

137. Herpetology (3). Prerequisite: Biol 140. Ecology, evolution and diversity of the reptiles and amphibians of the world. (2 lecture, 3 lab or field hours*)

138. Animal Ecology (3). Prerequisite: Biol 140. Studies of the environmental, behavioral and evolutionary factors influencing the distribution and population dynamics of animals. Field and laboratory exercises designed for the quantitative and qualitative description of ecological communities. (2 lecture, 3 lab or field hours*)

140. Ichthyology (3). Prerequisite: Biol 140. Ecology, evolution and diversity of the fishes of the world with emphasis on California fishes, freshwater and marine. (2 lecture, 3 lab or field hours*)

157. Histology (4). Prerequisite: college zoology. Identification and study of vertebrate cells, tissues, and organs. (2 lecture, 6 lab hours)

158. Hematology (3). Prerequisite: Phy 65; Micro 117 recommended. Development, structure, identification and quantification of cellular blood elements; qualitative and quantitative considerations of hemoglobin, coagulation and immunohematology. Procedural proficiency emphasized in the laboratory. (2 lecture, 3 lab hours)

160. Vertebrate Embryology (4). Prerequisite: college zoology. Morphogenesis of vertebrates from gamete formation through organogenesis, including physiological and experimental aspects of development. Laboratory emphasis on frog, chick and pig. (2 lecture, 6 lab hours)

165. Ornithology (3). Prerequisite: Biol 140. Ecology, ethology, evolution and diversity of the birds of the world. (2 lecture, 3 lab or field hours*)

175. Vertebrate Evolution (3). Prerequisite: Biol 135; Zool 103 or 113. The course of evolution of the higher vertebrates including present concepts of speciation.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

200 Series. Graduate courses are listed under *Biology*.

Moss Landing Marine Laboratories

The California State University began operation of the Moss Landing Marine Laboratories, Moss Landing, California, in the fall semester 1966. This facility functions as a seaside extension of the campuses of six cooperating state universities (Fresno, Hayward, Sacramento, San Francisco, San Jose and Stanislaus.) It offers full-time coursework in marine biology, oceanography, and other marine sciences for majors in either the biological (botany, biology, zoology) or physical sciences whose objectives include further graduate study, teaching the sciences or research in the marine sciences. Properly qualified upper-division and graduate students may enroll on the CSU, Fresno campus for a term of instruction at Moss Landing and earn resident credit for such coursework. See *Geology Department* for on-campus coursework in general oceanography and geology courses related to marine science.

Space reservation is required for attending Moss Landing Marine Laboratories. Forms for this purpose are available from the Biology Department or Moss Landing Marine Laboratories, P.O. Box 223, Moss Landing, CA 95039. Priority is determined based upon the date the space reservation form is received at Moss Landing Marine Laboratories. Since enrollment is limited, interested students should make early application.

COURSES

Marine Sciences (M Sci)

Note: The following courses are offered at the Moss Landing Marine Laboratories. See M Sci 103 and 104 usually recommended for first semesters of full-time students.

The biology department will accept only the following Moss Landing Marine Laboratories courses for major credit as indicated. Botany: M Sci 131, 144. Zoology: M Sci 112, 113, 122, 123, 124, 125. Biology elective: M Sci 103, 104.

103. Marine Ecology (4). Prerequisite: ecology and statistics (or concurrent registration in M Sci 104) or permission of instructor. A field-oriented introduction to the interrelationships between marine and estuarine organisms and their environment with emphasis on quantitative data collection and analysis. (2 lecture, 6 lab or field hours)

104. Quantitative Marine Science (4). Prerequisite: college mathematics. The mathematical methods for analysis of biological, chemical and physical data from the marine environment; experimental design, parametric and non-parametric statistics. (3 lecture, 3 lab or field hours)

* Late afternoon, Saturday and/or overnight field trips may be required.

105. Marine Science Diving (3). Prerequisite: upper-division science major; thorough physical examination; ability to pass swimming test. Skin and SCUBA diving course; pool-training culminates in 10 ocean dives. Topics covered include diving physics, physiology, diving environments, night diving and research diving. Successful completion gives NAUI and MLML certification. (1 lecture, 6 lab or field hours)

110. Introduction to Marine Behavior (4). Basic theoretical concepts of animal behavior, stressing the causation, development, and evolution of behavior. Emphasis is on the marine environment. Prerequisites: M Sci 103 or consent of instructor. (3 lecture and 3 lab hours)

112. Marine Birds and Mammals (4). Prerequisite: upper-division vertebrate zoology; M Sci 103 recommended. Systematics, morphology, ecology and general biology of marine birds and mammals. (2 lecture, 6 lab or field hours)

113. Marine Ichthyology (4). Prerequisite: college zoology or equivalent. Taxonomy, morphology, and ecology of marine fishes. Both field and laboratory work concentrate on the structure, function and habits of marine fishes and the ecological interactions of these fishes with their biotic and abiotic surroundings. (2 lecture, 6 lab or field hours)

122. Marine Invertebrate Embryology (4). Prerequisite: M Sci 124, cell biology or biochemistry strongly recommended or permission of instructor. Survey of principles of developmental biology, concentrating on experimental evidence obtained using invertebrate material. Laboratory observations will cover the embryology of lower invertebrates, molluscs, crustacea, enchinoderms, and protochordates. (2 lecture, 6 lab or field hours)

123. Physiology of Marine Organisms (4). Prerequisite: General physiology or permission of instructor. Comparative physiology of marine organisms; laboratory problems on nutrition, respiration, osmotic regulation, coordination, and other physiological functions. General principles of physiology discussed using examples from the major taxa. (2 lecture, 6 lab hours)

124. Marine Invertebrate Zoology I (4). Prerequisite: college zoology or permission of instructor; M Sci 103 recommended. A field-oriented introduction to the structure, systematics, evolution and life histories of the major phyla. (2 lecture, 6 lab or field hours)

125. Marine Invertebrate Zoology II (3). Prerequisite: college zoology or permission of instructor; M Sci 103 and M Sci 124 recommended. A field-oriented introduction to the structure, systematics, evolution and life histories of the minor phyla. (1 lecture, 6 lab or field hours)

131. Marine Botany (4). Prerequisite: M Sci 103 recommended. Introduction to the plants of the sea, marshes and dunes, with emphasis on the morphology, taxonomy and natural history of seaweeds and vascular plants. (2 lecture, 6 lab or field hours)

141. Geological Oceanography (4). Prerequisite: M Sci 142 or 143 (concurrent enrollment satisfactory). Structures, physiography, and sediments of the sea bottom and shoreline. (2 lecture, 6 lab or field hours)

142. Physical Oceanography (4). Prerequisite: college algebra; college physics recommended. An introduction to the nature and causes of various oceanic motions including currents, waves, tides and mixing, and the physical properties of seawater including transmission of sound and light; does not require calculus. (3 lecture, 3 lab or field hours)

143. Chemical Oceanography (4). Prerequisite: one year of college chemistry. An introduction to the theoretical and practical aspects of the chemistry of the oceans, including major salts, dissolved gases, nutrient ions, carbonate system, transient tracers and shipboard sampling techniques. (2 lecture, 6 lab and field hours)

144. Biological Oceanography (4). Prerequisite: general biology and general chemistry. The ocean as an ecological system. Emphasis will be on the complexity of organismal-environmental interaction of the plankton, the transfer of organic matter between trophic levels and nutrient cycles. Laboratory will include methods in sampling, shipboard techniques, identification of plankton and current analytical techniques. (2 lecture, 6 lab or field hours)

161. Marine Fisheries (4). Prerequisite: college mathematics, M Sci 104, or permission of instructor; M Sci 103 recommended. An introduction to fishery biology, including the concepts of stock, recruitment, and yield; emphasizing the parameters abundance, age, growth, and mortality; discussion of hydrography and fishery ecology, management problems, world fisheries and mariculture; and collection and analysis of fishery data. (2 lecture, 6 lab or field hours)

173T. Topics in Marine Biology (1–4). Prerequisite: permission of instructor. The study of a selected area in marine biology (morphology, physiology, ecology, etc.). Subjects will vary depending on student demand and availability of instructors. (Lecture and/or Laboratory)

174T. Topics in Oceanography (1–4). Prerequisite: permission of instructor. The study of selected areas in oceanography; subject will vary depending on student demand and availability of instructors. (Lecture and/or Laboratory)

175T. Topics in Marine Science (1–4). The study of a selected area in the marine sciences. The subjects will vary depending on student demand and availability of instructors. (Lecture and/or Laboratory)

177. Microscopic Techniques (3). Prerequisite: one semester college physics and permission of instructor. Principles and techniques of light and electron microscopy; consideration of brightfield, darkfield, phase contrast and interference contrast light microscopy; episcopic and diascopic illumination systems; photomicrography; preparation of materials for and operation of the scanning electron microscope. (2 lecture, 3 lab hours)

180. Independent Study (1–4). Prerequisite: permission of instructor. Faculty directed study of selected problems; open to undergraduate students with adequate preparation. Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.*)

202. Marine Instrumental Analysis (4). Prerequisite: M Sci 142 and 143. Theory and use of advanced instrumentation; advanced field and laboratory techniques for the interpretation of data collected in marine science research. (2 lectures, 6 lab or field hours)

211. Behavior of Marine Animals (4). Prerequisite: M Sci 103 and 110, or permission of instructor. Advanced topics in the development and expression of social behavior and organization

of societies. Stresses contributions of environment, kin selection, parent-offspring interactions, and reciprocity to behavior. Offered alternate spring semesters. (3 lecture, 3 lab or field hours)

212T. Advanced Topics in Marine Vertebrates (1–4). Prerequisite: M Sci 112 or 113, and also permission of instructor. Advanced considerations of the ecology, physiology, and phylogeny of fishes, birds or mammals; emphasizing current literature and research. (Lecture and/or Laboratory)

221T. Advanced Topics in Marine Invertebrates (1–4). Prerequisite: M Sci 124 and permission of instructor. Advanced considerations of the ecology, physiology, and phylogeny of the various invertebrate phyla emphasizing current literature and research. (Lecture and/or Laboratory)

222. Biology of the Mollusca (4). Prerequisite: M Sci 124 and permission of instructor. Systematics, functional morphology, ecology, and physiology of mollusca with emphasis on marine forms. (2 lecture, 6 lab or field hours)

231. Biology of Seaweeds (4). Prerequisite: M Sci 131 or permission of instructor. Lectures-discussions on marine macroalgal biology with extensive reading of original literature. Ecologically oriented individual research projects involving laboratory culture and field experimentation. (2 lecture, 6 lab or field hours)

233T. Advanced Topics in Marine Ecology (1–4). Prerequisite: M Sci 103 and permission of instructor. Selected topics and current issues in marine ecology; subjects will vary depending on student demand and availability of instructors. (Lecture and/or Laboratory)

234. Advanced Biological Oceanography (4). Prerequisite: M Sci 144 or permission of instructor. A continuation of biological oceanographic studies; course will include lectures and discussion of special topics such as human impact on the marine environment and critical analyses of current literature; an individual research project involving the use of one or more available analytical tools required. (2 lecture, 6 lab or field hours)

242. Plate Tectonics (3). Prerequisite: M Sci 141 or permission of instructor. Historical background, modern theory and geophysical evidence of continental drift; sea-floor spreading and plate tectonics; examinations of the impact of the recent revolution in historical geology.

244. Paleoceanography (4). Prerequisite: M Sci 141 or permission of instructor. Interdisciplinary studies of the provenance, biologic and geologic composition of marine sediments and of the organisms contributing to their formation; sedimentary processes affecting these sediments. (2 lecture, 6 lab or field hours)

245. Deep Sea Sedimentation (4). Prerequisite: M Sci 141 or permission of instructor. Study of the types of marine sediment found in the deepest parts of all oceans; the sedimentary processes responsible for the deposition, preservation and re-deposition of these sediments. (2 lecture, 6 lab or field hours)

251. Marine Geochemistry (4). Prerequisite: quantitative analysis, year of calculus, or permission of instructor. Geochemical processes in the oceans; thermodynamics of low temperature aqueous reactions, weathering, oxidation-reduction and biologically mediated reactions, processes occuring at the sea floor and air-sea interface. (2 lecture, 6 lab or field hours)

I am intrigued by new explanations of the world — the whole universe. I am in awe of everything from protozoa to galaxies. I'm still a little kid poking around in a pond chasing a frog — which, by the way, I never did.

Fred E. Schreiber
Professor, Biology

261. Ocean Circulation and Mixing (4). Prerequisite: M Sci 142; college physics strongly recommended. Mathematical description of the distribution of properties (e.g. density, dissolved oxygen) in the oceans relating to physical and biochemical processes; theory of distribution of variables, geostrophic method. (3 lecture, 3 lab hours)

271. Population Biology (3). Prerequisite: M Sci 103 and 104 or permission of instructor. Principles of the interaction among marine organisms which result in the alternation of population structures; techniques for assessment and management of animal populations. (2 lecture, 3 lab or field hours)

272. Subtidal Ecology (4). Prerequisite: MLML diver certification and marine ecology; knowledge of marine algae, invertebrates, and statistics recommended. The ecology of nearshore rocky subtidal populations and communities with emphasis on kelp forests; lectures and discussions of original literature; field work with SCUBA including group projects on underwater research techniques and community analysis, and individual research on ecological questions chosen by student. (2 lecture, 6 lab or field hours)

274T. Advanced Topics in Oceanography (1–4). Prerequisite: permission of instructor. The study of a selected area in oceanography. The subjects will vary depending on student demand and availability of instructors. (Lecture and/or Laboratory)

285T. Seminar in Marine Biology (2; max total 4). Prerequisite: permission of instructor. Seminar will be held on topics changing each semester; each student will be required to give at least one seminar.

286T. Seminar in Marine Geology (2; max total 4). Prerequisite: permission of instructor. Seminar will be held on topics changing each semester; each student will be required to give at least one seminar.

287T. Seminar in Oceanography (2; max total 4). Prerequisite: permission of instructor. Seminar will be held on topics changing each semester; each student will be required to give at least one seminar.

295. Research in the Marine Sciences (1–4). Prerequisite: permission of instructor. Independent investigations of an advanced character for the graduate student with adequate preparation. (3 conference, lab, and field hours per unit)

299. Thesis (1–4; max total 4). Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

BUSINESS
Accountancy

School of Business and Administrative Sciences
Department of Accountancy
Dennis M. Baker, Chair
Peters Business Building, Room 284
(209) 278-2852

B.S. in Business Administration
Accountancy Option



The Department of Accountancy offers an option in accounting within the Bachelor of Science in the Business Administration degree program. This option is designed to be broad enough to provide preparation for a career in public, industrial or governmental accounting. A lecture/lab format has been incorporated into several courses where hands-on experience with microcomputers is provided. The accounting topics of tax, information systems, managerial and financial accounting are also covered in sufficient depth to prepare the student for the exams for Certified Public Accountant (CPA), Certificate in Management Accounting or Certificate in Internal Auditing.

Faculty and Facilities

The faculty of the Department of Accountancy is comprised of approximately 20 individuals of varied academic and business experience backgrounds. They are specialists in the areas of financial accounting, taxation, cost accounting, auditing and accounting information systems. Their accumulation of academic preparation and business experience qualifies them to teach both the theoretical and practical applications of accounting.

Career Opportunities

A wide variety of professional business opportunities are available to graduates of the Department of Accountancy. The accountancy option prepares students for challenging and rewarding careers in all areas of accounting. Alumni of the Department of Accountancy are found in leadership positions locally, in other areas of California, and throughout the United States. Many of our graduates are currently partners in public accounting firms, officers in corporations and executives in governmental agencies. Joy Catalano, a 1982 graduate of the department, received the second highest grade in the nation on the CPA exam, and David Kalemkarian, a 1984 graduate of the department, received the second highest score in California on the CPA exam. Many of our students pass the entire CPA exam on the first sitting. In conjunction with the department, the Valley Business Center (located within the school) offers a CPA Review Course twice a year. This course is designed to meet the needs of the serious CPA candidate and covers thoroughly all exam areas: practice, theory, auditing and business law.

To find out more about career opportunities, students should consult with the faculty in the department. In addition, students with career-related questions are encouraged to contact the *Office of Career Development and Employment Services*. Services include career counseling by career information specialists and professional assistance to students and graduates seeking full-time or part-time positions.

Internships

Many of our students also participate in internship programs, both in Fresno and other parts of California, in which they receive academic credit while being paid for their services. Students interested in internships in accounting should inquire in the department office or the office of the dean.

Faculty

Dennis M. Baker, *Chair*

Wayne R. Chapin
Rosita S. Chen
Elwyn L. Christensen
Robert M. Harper
Gerald L. Johnston
Garo Kalfayan
W. Don McFerrin
Dell L. Mortimer
John P. Osborn
Sheng-Der Pan
Ali A. Peyvandi
Benjamin Y. Tai
C. Torben Thomsen
Charles B. Titus
William C. Wayne

Bachelor of Science Degree Requirements

Business Administration Major

A 40–43 unit business core provides students with a general background commonly acknowledged as furnishing the basis for effective management of business enterprises. The following courses are required of all business majors.

	Units
Core requirements	40–43
Acct 4A–B; B A 18; DS 73, 173; Fin 120; IS 50 (or demonstration of computer literacy); IS 160; POM 124; Mgt 110 or 104–106, 187; Mktg 100	
General Education requirements	54
Business majors must take Econ 40 (or Ag Ec 1) and Econ 50. Business students must also complete DS 71 or one semester of approved college mathematics beyond intermediate algebra.	

Electives 0
Accountancy Option 34–35
Required courses ..... (19)
Acct 120A–B, 132, 146; IS 105W
Electives within the option ..... (15–16)
Any four courses from the following:
Acct 144, 145, 147, 148, 162, 165, 167, 189T; B A 150
Total for Business Administration degree 128–132

Note: The completion of 34–35 units as required by the option, the General Education requirements, special course requirements and the electives, which may include a minor, total the 128–132 units required for the Bachelor of Science in Business Administration.

COURSES

Accountancy (Acct)

3. Essentials of Accounting (3). Not open to students majoring in accounting or business administration. Basic concepts in preparation of business financial statements; introduction to understanding, analyzing and interpreting accounting data by investors, managers and creditors for decision making, planning and control. Only minor attention given to recordkeeping procedures.

4A–B. Financial and Managerial Accounting Principles and Systems (3–3). Not open to freshmen; meets requirements for Acct 1A–B. **(A)** Financial accounting; accounting statements, transaction analysis and data accumulation; partnership and corporation accounting. (CAN BUS 2) **(B)** Prerequisite: Acct 4A. Balance sheet analysis and interpretation: managerial control and information systems; organization, planning, budgeting; cost accumulation and capital budgeting; measuring and reporting performance. (CAN BUS 4)

120A–B. Intermediate Accounting (4–4). Prerequisite: for 120A, Acct 1A or 4A; for 120B, Acct 120A (Note: 4B and 120B may be taken concurrently); Math 71 or DS 71 recommended. Preparation and analysis of balance sheet and income statements; proprietorship corporation accounts; basic accounting theory; theory of current and fixed assets, investments, liabilities, funds-flow, price-level changes, accounting ethics, authoritative pronouncements and unsettled issues.

129. Accounting for Management and Taxation (3). Not open to students with credit in Acct 120A, 132 and 144; not open for credit toward major in accounting. Prerequisite: Acct 1A–B or Acct 4A–B. Analysis and interpretation of financial statements. Use of accounting data by management for planning and control. Basic concepts of federal income taxes. Tax planning.

132. Cost Accounting (4). Prerequisite: Acct 1A–B or 4A–B. Math 71 or DS 71, and IS 50 recommended. Industrial cost accounting; general principles of product costing, standard costing, differential costing; master budgeting, flexible budgeting and capital budgeting; emphasis on the three functions of management — decision making, planning and control. (3 lecture; 2 lab hours)

144. Tax Accounting and Planning (4). Prerequisite: Acct 4A. Federal income taxation, research and planning affecting individuals.

145. Tax Research and Tax Accounting for Corporations and Partnerships (4). Prerequisite: Acct 144. Methods of tax research using the sources of tax law. Applications of research to tax planning, litigation, administration of a tax practice and professional responsibilities. Effect of income tax laws on partnerships, corporations, estates and trusts; estate and gift taxes.

146. Accounting Information Systems and Controls (4). Prerequisite: Acct 120A, 132, IS 50. Design of systems for the collection, organization and reporting of accounting information. Theory and practice of flowcharting, evaluation of internal accounting controls in computer systems environments, and interrelationships of people, procedures and equipment. (3 lecture; 2 lab hours)

147. Advanced Accounting Information Systems (4). Prerequisite: Acct 146. Analysis and design of expert systems in accounting and auditing; applications of database and telecommunications developments to accounting systems; control and audit implications of advances in computer technology. (3 lecture; 2 lab hours)

148. Accounting for Governmental and Nonprofit Organizations (4). Prerequisite: Acct 120A, 132. Concepts, principles and problems of accounting for governmental and nonprofit organizations. Budgeting, fund accounting, cost/benefit analysis, cash planning and control, and independent auditing are introduced in the context of making decisions in governmental and nonprofit organizations.

162. Auditing (4). Prerequisite: Acct 120A–B, 146. Objectives and techniques in verification of business financial statements; duties, responsibilities and professional ethics of the auditor; auditor's reports; analysis of internal controls; audits of computerized systems. (3 lecture; 2 lab hours)

165. International Accounting (4). Prerequisite: Acct 120A, 120B, 132. Accounting concepts, principles and methods for multinational corporations. Currency for translation of financial statements, financial reporting, international accounting and auditing standards, and the managerial aspects of multinational transactions.

167. Advanced Accounting Problems (4). Prerequisite: Acct 120B. Partnership, corporation, governmental and institutional accounting.

189T. Topics in Accounting and Auditing (1–4). Prerequisite: 18 units of accounting. Specialized study in a particular area of professional accountancy: accounting theory, auditing, accounting information systems, contemporary developments in financial and managerial accounting, and the practice of accountancy.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only.

195. Internship (2–6; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or government agency and reports on firm's operations and suggested improvements. *CR/NC* grading only.

200 Series. Graduate courses are listed under *Business — Graduate Program.*

BUSINESS
Finance and Business Law

School of Business and Administrative Sciences
Department of Finance and Business Law
Paul M. Lange, Chair
Peters Business Building, Room 285
(209) 278-2341

B.S. in Business Administration
Options:
- **Agribusiness**
- **Finance**
- **Financial Services**
- **International Business**
- **Legal Environment of Business**
- **Real Estate and Urban Land Economics**
- **Risk Management and Insurance**



The Department of Finance and Business Law offers seven options (areas of emphasis) within the Bachelor of Science in the Business Administration degree program. These options are:

The *Agribusiness Option* offers students an opportunity to blend courses in business with courses in agriculture in order to gain a knowledge of agribusiness. Students who specialize in agribusiness find career opportunities in banking, finance, real estate, marketing, selling, wholesaling, transportation, manufacturing, processing, insurance and many other industries of the San Joaquin Valley and other predominantly agricultural regions of the world.

The *Finance Option* is designed to provide students the basic skills required to plan, supervise and control the financial activities of business organizations. These include understanding the trade-off between risk and return, the time value of money and the magnifying effect of leverage. Students specializing in finance gain the skills related to evaluating the financial needs of a business, obtaining the funds required by the firm and using these funds in such a way that the company's goals are met.

The *Financial Services Option* offers students the opportunity to broaden their knowledge and understanding of the financial sciences so as to improve their ability to make effective decisions in financial planning and to facilitate career development in the general area of financial services. Since financial planning typically involves responsibility for coordinating work in more than one financial area, this option enables students to take the broad range of courses necessary to be knowledgeable in this rapidly expanding field.

The *International Business Option* recognizes the importance of the multinational corporation in today's world economy and prepares students for a wide range of careers in international business. The international aspects in each of the functional areas of finance, management and marketing; as well as the complexities of international banking, the foreign exchange markets and the Eurocurrency markets are stressed. A unique feature of this option is the London Seminar in International Finance.

The *Legal Environment of Business Option* provides an excellent background for business people who will spend a considerable amount of their time resolving business-related, legal problems. Many non-lawyers find a broad knowledge of law extremely helpful in their business careers. As a result, this option can be recommended for all business majors.

The *Real Estate and Urban Land Economics Option* provides the background for a wide range of career opportunities in addition to real estate brokerage. These areas include government, industry, education, consulting, banking, insurance, appraisal, construction and investment. In addition, students who complete the real estate option have taken all courses necessary to qualify for taking the California Brokers License Examination.

The *Risk Management and Insurance Option* prepares students for careers not only within the insurance industry but in business and government as well. More than half of all insurance employees hold professional, managerial or technical jobs. Businesses seek insurance trained employees to manage employee benefit plans and oversee risk management programs. Government, likewise, offers positions in the areas of insurance regulation and administration of social insurance programs.

Faculty and Facilities

The faculty of the Department of Finance and Business Law is comprised of more than 30 full-time and part-time individuals who have outstanding reputations in both business and education. All full-time members of the department have earned an appropriate doctorate degree and many of them have gained national reputations for their scholarship. The faculty is extremely active in research and textbook writing as well as active in working with the business community. A wide range of approaches are used in teaching the many different courses offered by the department. These include computer simulations, team projects, community projects, laboratory research, group discussions, case studies, internships and foreign studies programs. The broad background of the faculty and their strong commitment to business education assures students of a challenging and rewarding course of study.

Faculty

Paul M. Lange, *Chair*

Wayne A. Brooks
Kuang C. Chen
Tom Doyel
Lynn M. Forsythe
Harold H. Haak
James M. Highsmith
Amir A. Jassim
Ida M. Jones
Deborah J. Kemp
Blair J. Kolasa
Gerald D. Martin
J. David Reitzel
Manuchehr Shahrokhi
Elizabeth M. Shields
Charles R. Smith
Donald P. Stegall
Kuo-cheng Tseng
Alan Rufus Waters
Joseph W. Wilson
Rassoul Yazdipour

Bachelor of Science Degree Requirements

Business Administration Major

A 40–43 unit business core provides students with a general background commonly acknowledged as furnishing the basis for effective management of business enterprises. The following courses are required of all business majors.

	Units
Core requirements	40–43
Acct 4A–B; B A 18; DS 73, 173; Fin 120; IS 50 (or demonstration of computer literacy); IS 160; POM 124; Mgt 110 or 104–106, 187; Mktg 100	
General Education requirements	54
Business majors must take Econ 40 (or Ag Ec 1) and Econ 50. Business students must also complete DS 71 or one semester of approved college mathematics beyond intermediate algebra.	
Electives	0–12
Option	18–32
Select one of the seven options outlined below.	
Total for Business Administration degree	124–129

Options

The seven options available to students are outlined below. The completion of 18–32 units as required by the options, the General Education requirements, special course requirements, and the electives, which may include a minor, total the 124–129 units required for the Bachelor of Science in Business Administration.

Agribusiness Option	*Units*
Fin 137, Ag Ec 130	6
Approved upper-division electives from the schools of Business and Agriculture	12
	18

Finance Option	
B A 100	3
Fin 121, 122, 123, 128, 139	16
Elect 2 from: Fin 132, 137, 138, 143, 180; B A 150 or 151; Acct 120A or 129	6–7
	25–26

Financial Services Option	
B A 100	3
Acct 129 or 144	3–4
Fin 128, 132, 143, 150, 180; B A 160	18
Select any two of the following: Fin 122, 123, 138, 139, 144, 145, 183; B A 101, 154 or other approved electives	6–7
	30–32

International Business Option*	
B A 174, 175, 176, 178	12
Mktg 176	3
Mgt 131	3
Electives**	12
	30

* Students selecting the International Business Option must successfully demonstrate conversational proficiency in a language other than English.
** Requires prior approval of faculty adviser.

Legal Environment of Business Option	
Elect from B A 150, 151, 154, 155, 157, 158	12
Elect from approved upper-division courses in accounting, business administration, finance, human resource management, management, marketing, decision science, information systems, information management	9
	21

Real Estate and Urban Land Economics Option	
Fin 180, 181, 182, 183; B A 154	15
Fin 122 or 132	3
Elect from B A 100; Fin 123, 185, 186	3–4
	21–22

Risk Management and Insurance Option	
Fin 143, 144, 145, 146; B A 160	15
Elect from approved upper-division courses in accounting, business administration, finance, human resource management, management, marketing, decision science, information systems, information management, health sciences	3
	18

COURSES

Business Administration (B A)

18. Business and the Legal Environment (4). Prerequisite: sophomore standing. Introduction to legal system; sources of law; administrative, criminal, tort and labor law; economic regulation and legal aspects of international trade. More extensive study of the law of contracts and agency. Case studies; discussion and analysis.

50. Business Lectures (1; max total 2). Various viewpoints on current business problems and developments presented by a different guest business executive each class meeting.

88. Critical Thinking in the Legal Environment of Society (3). Not open to students having completed B A 18 or equivalent. Influence of law on politics, ethics, social action and the economy. Differentiation of legal and scientific fact-finding. Comparison of processes of negotiation, mediation, arbitration and litigation. Analysis of the decision-making process. Application of flowcharting to legal process.

100. Business and Real Estate Economics (3). Prerequisite: Econ 40, 50. Applications of economic principles in business and real estate management; measure of profit, analysis of demand, cost analysis; price, wage and public policies; case studies, analysis.

101. Business Ethics (3). (A Eth 102A may be substituted for B A 101.) Ethical practices and their relevance to the realm of business. Managerial treatment of contemporary business problems from an ethical perspective. Problem areas include: employee rights, discrimination in the workplace, environmental protection, multinational business transactions and conflicts of interest.

108. Law and Society (3). An introduction to the American legal system. Examines the development, structure, premises, functions, operation and limits of the legal system of the United States. Includes an overview of American substantive law — its sources, varieties, purposes, methods of growth, and relationships to morality and to non-law disciplines. General Education CAPSTONE Cluster, Critical Thinking. (Former B A 8)

120. Business and Society (3). Contemporary American business from the business perspective. Examination of current governmental, public and labor pressures affecting business. Consideration of philosophical critiques of business. The nature of business and management of firms in a changing environment. General Education CAPSTONE Cluster.

150. Law and Business Activities (3). Prerequisite: B A 18. Nature of property and the relation of the legal environment to the ambiguities of economic capability through examination of the law of bailments, shipments, sales, commercial paper and secured transactions; case studies; analysis.

151. Law of Business Organizations (3). Prerequisite: B A 18; Acct 4A recommended. Partnerships, corporations and trusts with reference to their advantages and limitations. Effect of form of operations on taxation, freedom from liability and on social responsibilities. Includes bankruptcy and security transactions, such as mortgages and installment sales.

154. Real Estate Law (3). Meets California statutory course requirement for real estate broker's license. Prerequisite: B A 18. Legal aspects of acquisition and ownership of real estate; conveyances, mortgages, evidences of title; planning and zoning.

155. Government Regulation and Control of Business (3). Prerequisite: B A 18; not recommended for those with B A 157. Government and social control of private enterprise, including examination of capitalism, private property, administrative law and process, antitrust law, and development of public policy through regulation and deregulation.

156. Labor Law (3). Prerequisite: Econ 40, 50; B A 18, Mgt 104, 106 recommended. Proseminar in the law of industrial relations; historical and current principles for legal settlement of labor-management disputes; statutes, court decisions, administrative rulings; case studies; individual presentations.

157. Administrative Law and Business (3). Prerequisite: B A 18; not recommended for those with B A 155. The administrative process and its effects on business. Examination of the interaction among regulatory agencies, legislature, judiciary and business.

158. Environmental Legislation and Controls (3). Review of environmental problems, search for root causes and objectives; identification and evaluation of past and present controls; examination of alternative legislative remedies for present and anticipated problems.

160. Estate Planning (3). The federal and state systems for regulating and taxing property transfers during lifetime and upon death including the policy and theory underlying the system and practical problems involved in applying estate and gift tax laws.

174. Introduction to International Business (3). Prerequisite: for business majors, Fin 120; for others, permission of instructor. Competing in world marketplace. Impact of differing cultural, political, legal systems. Multinational corporations, importing, exporting, international contracts, investment across national borders. Forecasting government policies and changing market forces on world business conditions.

175. Management of Multinational Enterprises (3). Prerequisite: B A 174 or permission of instructor. The rise of the multinational corporation. Global corporate management perspective. Managing legal, social, political, financial and taxation interfaces. Personnel, production and logistical tactics in a global strategy. Corporate negotiations with national government and private national interests.

176. World Commerce and Development (3). Prerequisite: B A 174 or permission of instructor. World commerce, international investment, economic growth. Tools and techniques of international investment. Discovering and selecting international projects. Taxation, legal systems, government regulations; effect on foreign investment. International accounting practices.

178. International Finance (3). Prerequisite: Fin 120. Evolution of international monetary system; balance of payment accounting; foreign exchange; forecasting exchange rates; management of foreign exchange risk; political risk analysis; foreign direct investment; international money and capital markets; Eurocurrency markets; international banking; international monetary and banking organizations.

189T. Topics in Business Administration (1–3; max total 9 if no topic repeated). Studies in business administration.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only.

195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or government agency and reports on firm's operations and suggested improvements. *CR/NC* grading only.

200 Series. Graduate courses are listed under *Business — Graduate Program.*

Finance (Fin)

30. Introduction to Investments (3). Alternative uses of savings; stocks, bonds, mortgages and other securities, mutual funds, credit unions, banks, savings and loans, real estate investment trusts, insurance; financial security; mathematics of finance. Not recommended for Business Administration majors.

120. Principles of Finance (4). Prerequisite: Econ 40, 50; Acct 4A-B (may be taken concurrently). Theory of financing the business firm under uncertainty. The supply of and demand for capital; asset management, simulation problems, capital structure analysis; cost of capital; capital budgeting decisions; mathematics of finance. (3 lecture; 2 lab hours) (Former Fin 130)

121. Intermediate Financial Management (3). Prerequisite: Fin 120. Modern theories of corporate finance; financial decision making under uncertainty; efficient allocation of financial resources; advanced financial planning and control strategies.

122. Monetary Policy and the Banking System (3). Not open to students with credit in Econ 135. Prerequisite: Fin 120. Evolution of monetary economies; role of central banks in domestic and international financial markets; monetary theory; development and implementation of monetary policy; interaction of fiscal and monetary policies; regulatory issues in financial markets. (Former Fin 135)

123. Business Forecasting (4). Prerequisite: Fin 120; DS 173. Business activity analysis; methods of forecasting; general and specific forecasts; analysis of trends in product groups, sectors, regions, and other areas of the world economy; mathematical models and statistical decisions; analysis of case problems, computer lab. (3 lecture; 2 lab hours) (Former Fin 136)

128. Security Analysis (3). Prerequisite: Fin 120. Analysis of security markets; financial mathematics; debt and equity instruments; fundamental analysis; technical analysis; public and private regulation of security markets. (Former Fin 134)

132. Financial Institutions (3). Prerequisite: Fin 120, 122. Analysis of depository and nondepository financial institutions; structure of consumer and commercial credit markets; credit management strategies; risk management for interest and exchange rate variability; financial asset and liability management policies; public policy toward financial institutions.

137. Credit Management (3). Prerequisite: Fin 120. Mercantile and consumer credit; derivation of credit information from business data; credit agencies and credit bureaus; valuation; analysis of financial statements; technical and legal problems; collections.

138. Portfolio Management and Theory (3). Prerequisite: Fin 120, 128. Methods of determining the most desirable group of securities to build in an investment portfolio; investment techniques of portfolio risk using; portfolio trading rules; CAPM; APT; and portfolio betas.

139. Financial Management (3). Prerequisite: senior level standing. Finance majors must have completed (or taking concurrently) all other required courses in Finance Option. Non-Finance majors need permission of the instructor. Integration of analysis and policy for financial organizations; decisions under uncertainty; mathematical models and simulation.

143. Risk and Insurance (3). Fundamentals of insurance and risk management. Covers the basic areas of property, liability, auto, life, health, and social insurance. Other areas including marketing, underwriting, claims, investments, and loss control.

144. Life Insurance (3). Nature and use, types and forms of life and health insurance and annuities. Covers organization, management and regulation; employee benefit plans, social security.

145. Property and Liability Insurance (3). Standard forms of property insurance including fire and allied lines, business interruption, and transportation insurance. Identification and treatment of personal, business, and professional liability situations. Analysis of major property and liability insurance contracts. Case studies.

146. Risk Management in the Business Enterprise (3). Identification, measurements, and treatment of property, liability, and personnel pure-loss exposures in the business environment. Strategies for developing and implementing risk management programs to effectively treat the costs of pure risk, including loss control and loss financing techniques.

150. Financial Counseling (3). Prerequisite: permission of instructor. The concept of a total coordinated system of personal financial planning; evaluate existing programs, design improved plans and coordinate execution to achieve stated objectives. Includes data gathering, the psychology of financial counseling, and the counselor's fiduciary responsibilities. Case studies.

180. Real Estate Principles (3). Meets California statutory course requirement for real estate salesperson's and broker's license. Theory and practice of urban land use. Location and legal dimensions, planning and market processes; financial and investment decisions in real estate; computer analysis and case studies.

181. Real Estate Appraisal (3). Prerequisite: Fin 120; Fin 180 or permission of instructor. Theory and determinants of real property value. Methods used in urban and rural property appraisals. Statistical techniques and the appraisal process; special purpose appraisals. Field work required.

182. Real Estate Practices (3). Meets California statutory course requirement for real estate broker's license. Relationship between public and private organizations active in real estate; company formation; selling and marketing techniques; financing; advertising; aspects of taxation; escrow procedure; property insurance; computer analysis and case studies.

183. Real Estate Finance (3). Prerequisite: Fin 120; Fin 180 or permission of instructor. Characteristics and underwriting standards of institutions furnishing funds for real estate investment and development. Alternative financial instruments and their effect on property economics and value.

185. Housing Market Analysis (3). Prerequisite: junior standing. Analysis of local and regional housing markets and submarkets; availability of market data; primary versus secondary data; design of data collecting instruments; interviewing techniques and interviewer bias; data analysis and presentation of findings; field studies required.

186. Issues in Urban Land Economics (3). Prerequisite: Fin 180. Impact of public and private institutions upon land use, periodic productivity, and value; zoning, subdivision regulations, building codes, private deed restrictions, rent control, regional authorities and growth management; pertinent case law, U.S. and California.

189T. Topics in Finance (1–3; max total 9 if no topic repeated). Studies in business including agricultural economics, business economics, legal environment of business, international business, finance, financial services, risk and insurance, and real estate.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only.

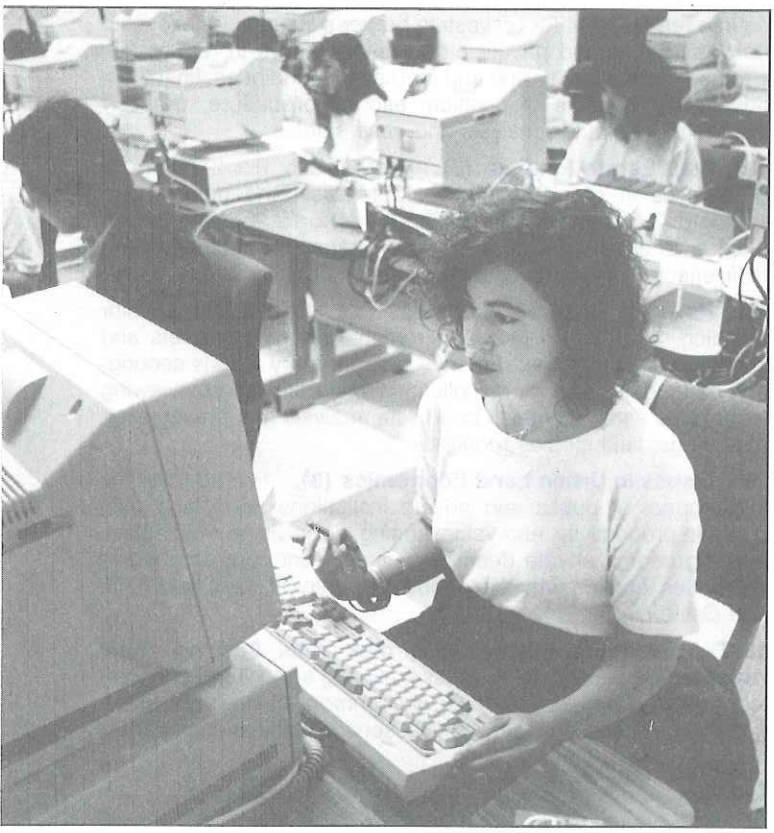
195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or government agency and reports on firm's operations and suggested improvements. *CR/NC* grading only.

200. Series. Graduate courses are listed under *Business — Graduate Program.*

BUSINESS
Information Systems and Decision Sciences

School of Business and Administrative Sciences
Department of Information Systems and Decision Sciences
Harry G. Costis, Chair
Peters Business Building, Room 287
(209) 278-2823

B.S. in Business Administration
Options:
- **Computer Applications and Systems**
- **Decision Systems**
- **Information Management**



The Department of Information Systems and Decision Sciences is interested in the study of computer applications and systems, the quantitative analysis of business data, and the newly developed and growing area of management of information. Three options (areas of concentration) within the Bachelor of Science in the Business Administration degree program, plus a certificate program are offered.

The *Computer Applications and Systems Option* offers the student an introduction into the vast area of computer technology and provides the knowledge and the skill for students to identify, analyze, and understand managerial problems and design solutions to these problems utilizing the computer. Upon graduation, students possess the necessary skills for entry level positions as programmers and systems analysts. The total program in this option is 24 semester units and includes courses in advanced programming in BASIC and COBOL as well as systems analysis and design and data base systems. Students entering this program should have a good base in mathematics including calculus.

The *Decision Systems Option* offers interested students the opportunity to study methods of quantitatively analyzing business data to support the decision-making role of management. In this option areas studied include applied statistics, operations research, systems analysis, and generally applied mathematics. With the availability of extremely effective computer systems, the drudgery of computation of complex mathematical functions has been drastically minimized making the analysis of data a substantial and necessary tool at the upper level of management. A good background in applied mathematics is necessary for students to successfully complete this program which consists of 20 semester units.

The *Information Management Option* prepares the student for a career as an information manager who serves as a consultant throughout business, securing and analyzing the computer users' information needs, and assisting them to utilize information for decision making. The ubiquity of computer systems at various forms (maxi, mini, micro) makes the information derived from analyzing business data abundantly available at all levels of management and necessitates a systematic management of such information. In addition, students choosing this option study new office automation systems as well as sophisticated word processing methods currently affecting the business world.

The *Certificate in Business Data Processing* is directed toward enhancing the knowledge of candidates for entry level data processing related positions. After the candidate has demonstrated that he/she has met prerequisites for the certificate program, the approval of the program coordinator or of the department chair must be obtained before the student may enter the program. Each student's individually designed program consists of a five course sequence chosen with the approval of the certificate program coordinator.

Statistical and Computer Laboratories

In addition to the classroom instruction, guest speakers and field trips, students who study the above three options are exposed to the department's computer laboratories for the quantitative, computer and business communication classes throughout the semester. The computer laboratories provide the student with the valuable opportunity of hands-on computer experience for such classes as computer programming and statistical analysis. Ten laboratory rooms with 220 microcomputers, plus a Quantitative Reasoning Lab, are the busiest rooms in the Leon S. Peters Business Building.

Faculty and Facilities

The Department of Information Systems and Decision Sciences employs more than 30 full-time faculty with extensive expertise in systems analysis, systems design, computer language programming, statistics, operations research, quality control, word processing systems, office automation, business communication and data base systems. These faculty come from all over the world and have Ph.D. degrees from major American and foreign universities. The modern computer and word processing laboratories offer the student a unique opportunity to become acquainted with the developments in the field of computer technology and applications.

Faculty

Harry G. Costis, *Chair*

Randy J. Anderson
Donald L. Beringson
Kelly J. Black
Priscilla M. Chaffe-Stengel
Jack Coffey
Mostafa Elhag
Berle Haggblade
Myron E. Hatcher
Charlotte J. Hiatt
Richard C. Lacy
Eric F. Lane
Patricia A. LaRosa
Wallace C. Liu
William S. Mallios
Kathleen E. Moffitt
Arlene A. Motz
Sasan Rahmatian
Peter Simis
Gayle A. Sobolik
Rafael Solis
Donald N. Stengel
Uthai Tanlamai
Tomasz Wielicki

Bachelor of Science Degree Requirements

Business Administration Major

A 40–43 unit business core provides students with a general background commonly acknowledged as furnishing the basis for effective management of business enterprises. The following courses are required of all business majors.

	Units
Core requirements	40–43
Acct 4A–B; B A 18; DS 73, 173; Fin 120; IS 50 (or demonstration of computer literacy); IS 160; POM 124; Mgt 110 or 104–106, 187; Mktg 100	
General Education requirements	54
Business majors must take Econ 40 (or Ag Ec 1) and Econ 50. Business students must also complete DS 71 or one semester of approved college mathematics beyond intermediate algebra.	
Electives	3–10
Option	20–24
(Select one of the three options outlined below.)	
Total for Business Administration degree	124

Options

The three options available to students are outlined below. The completion of the 20–24 units as required by the option, the General Education requirements, special course requirements and the electives, which may include a minor, total the 124 units required for the Bachelor of Science in Business Administration.

Computer Applications and Systems Option

It is recommended that students take IS 105W to satisfy the upper division writing skills requirement.

Option	Units
IS 54 Programming Languages — COBOL	3
IS 161 Systems Analysis	3
DS 72 (or one semester of approved college calculus)	3
IS 151 or 152	3
IS 165 and 166	6
Elect from: Acct 132; DS 180, 181, 182; IS 108, 109, 115, 116, 163, 164, 168, 189T, 190; Mgt 126 or any other approved upper-division IS elective	6
	24

Decision Systems Option

It is recommended that students take IS 105W to satisfy the upper division writing skills requirement.

Option	Units
DS 180	4
DS 181	4
DS 183	4
DS 187	4
DS 188	4
	20

(Students who plan to continue with graduate work in this area should take DS 72.)

Information Management Option

IS 105W satisfies the upper division writing skills requirement.

Option	Units
IS 54 Programming Languages — COBOL	3
IS 161 Systems Analysis	3
IS 103, 105W, 115	9
Elect from: IS 104, 108, 109, 116, 117, 120, 121, 122	9
	24

Certificate in Business Data Processing Requirements

Before entering the program, students will need to demonstrate that they have completed at least 6 units of elementary accounting and are conversant in two computer languages (preferably BASIC and COBOL). Approval of the certificate program coordinator or the chair of the department is necessary. Students also need to meet either one of the following criteria:

1. Bachelor's degree in any field from an accredited institution.
2. Associate of Arts degree from a two-year accredited college and minimum of two years of business experience.

Required Courses	Units
IS 161, 165, 166	9
Elective Courses (Select minimum of 6 units)	
IS 108, 109, 151, 152, 164, 168, 190, 195	6

Note: Both IS 190 and 195 cannot be counted for credit toward certificate.

COURSES

Decision Sciences (DS)

71. Quantitative Analysis I (3). Prerequisite: ELM Exam, intermediate algebra, one year high school geometry. Applications of finite mathematics in the quantitative formulation and solution of problems of modern management. General Education CORE, Quantitative Reasoning.

72. Quantitative Analysis II (3). Prerequisite: DS 71. Applications of selected tools of mathematical analysis in the quantitative formulation and solution of problems of modern management.

73. Statistical Analysis I (3). Prerequisite: ELM Exam, Math 71 or DS 71; Econ 40, 50 recommended. Introduction to descriptive statistical tools as applied to management decision making. Central tendency and dispersion measures; index numbers (CPI, deflators); time series analysis (trends, seasonal

variations); probability theory; probability and sampling distributions (normal, exponential, binomial, poisson); central limit theorem. (2 lecture; 2 lab hours)

129. Technology Assessment (3). Prerequisite: Core math, Engl 1. Assessment of impacts of emerging technologies, dynamics of technological change, commercialization issues, technology forecasting, risk assessment, environmental impacts, regulatory issues, technology planning and management, examination of key technologies. (Former DS 189T section)

173. Statistical Analysis II (3). Prerequisite: DS 73; IS 50. Statistical inference as applied to managerial problems and decision making. Emphasizes the inferential process; interval estimation, hypothesis testing, one- and two-way analysis of variance, regression, and correlation and related inferential analysis, non-parametric methods, Bayesian decision theory. (2 lecture; 2 lab hours)

175. Sampling Methods and Applications (3). Prerequisite: DS 173. Sample designs, estimation using samples, including simple random, stratified, cluster, systematic, area and multistage samples. Replicated sampling, acceptance sampling, industrial uses of sampling and non-probability designs.

176. Bayesian Inference and Decision Theory (3). Prerequisite: DS 173. Revision of probability and subjective interpretation. Bayes' theorem, statistical estimation of various parameters and decision theory, prior analysis and prior probability distributions; posterior analysis and posterior probability distributions; utility problems, expected value of perfect information.

178. Regression Analysis (3). Prerequisite: DS 72, 173. Linear and non-linear regression models including analysis of variance/covariance and time series analysis. Examination of least squares assumption. Classical versus Bayesian inference in regression. Application of BMD/SPSS statistical packages. (2 lecture; 2 lab hours)

180. Microcomputer Tools for Information Analysis (4). Prerequisite: DS 173, IS 160. Extensive use of microcomputer packages. Spreadsheet, data base, statistical, graphic and communication software for business modeling and management support. Data base files creation and transferring data and statistical analysis results to spreadsheet. (3 lecture; 2 lab hours)

181. Business Modeling Using Micros (4). Prerequisite: DS 180. Building business models using microcomputers. Applications in accounting, finance, marketing, production. Linear programming, sensitivity analysis, simulation, queuing methods, PERT/CPM. (3 lecture; 2 lab hours)

182. Principles of Operations Research (3). Prerequisite: DS 181. Managerial applications of operations research: deterministic and Stochastic models; case studies.

183. Time Series and Business Forecasting (4). Prerequisite: DS 180. Computer and software tools for forecasting, classical time series models. Linear regression as a forecasting tool. Serial correlation and generalized least sequences. The Box-Jenkins Model; case studies. (3 lecture; 2 lab hours)

187. Advanced Information Analysis (4). Prerequisite: DS 183. Regression and other multivariable statistical methods. Applications in accounting, finance, marketing and production. Analysis of variance, covariance, factor analysis, discriminant analysis, log linear models, cluster analysis and multidimensional scaling. (3 lecture; 2 lab hours)

188. Decision Support and Expert Systems (4). Prerequisite: DS 180, 181. Overview of the basic topics in decision support and expert systems. Methodological foundation for integration of quantitative and expert knowledge with the computer for improving the decision-making process. Integrating data bases, DSS models and business analysis. Introduction to artificial intelligence and expert systems. (3 lecture; 2 lab hours)

189T. Topics in Decision Sciences (1–3; max total 6 if no topic repeated). Prerequisite: 12 units in decision sciences. Theory or application of statistics or operations research applied to current developments.

190. Independent Study (1–3; max total see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only.

195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or a government agency and reports on firm's operations and suggested improvements. *CR/NC* grading only.

200. Series. Graduate courses are listed under *Business — Graduate Program.*

Information Systems (IS)

1L. Keyboarding (1).* Recommended for students with less than one semester of keyboarding or typewriting instruction. Development of keyboarding techniques on microcomputers for personal and business usage. (4 lab hours; course lasts 7½ weeks)

2. Word Processing Applications (2).* Prerequisite: IS 1 or equivalent. Introduction to word processing applications on microcomputers. Refinement of keyboarding techniques for personal and business applications. (4 lab hours)

20. Shorthand I (4). Prerequisite: IS 1 or equivalent. Mastery of theory; proficiency in reading, writing and transcribing shorthand. (2 lecture; 4 lab hours)

50. Computer Concepts (3). Introduction to computer hardware and software systems, impact of computers on society, ethical issues, application of computer technology in many career fields, hands-on laboratory experience with personal productivity software and programming. (2 lecture; 2 lab hours)

53. Programming Languages — FORTRAN (3). Prerequisite: ELM Exam, IS 50. Programming in FORTRAN, using batch and on-line systems. (2 lecture; 2 lab hours)

54. Programming Languages — COBOL (3). Prerequisite: ELM Exam, IS 50. Programming in COBOL, using batch and on-line systems. (2 lecture; 2 lab hours)

103. Principles of Office Management (3). Office management in business and industry; organization and control of office services; selection, training, and supervision of personnel; utilization of the computer and peripheral equipment in the office; improvement of office efficiency; office planning and layout; equipment and supplies.

104. Advanced Word Processing Applications (3). Prerequisite: IS 2 or equivalent. Advanced word processing applications, including additional applications in graphics. Also meets the needs of students working toward a standard secondary teaching credential in business subjects. (2 lecture; 2 lab hours)

* Not more than 6 units of credit in typewriting/keyboarding will be allowed toward any degree.

105W. Business Communication (3). Prerequisite: Engl 1, 3 units of English composition and junior standing. Business communication theory; analysis of communication alternatives; effective business writing and speaking; case studies. Meets the upper-division writing skills requirement for graduation.

108. Implementation of Information Systems (3). Prerequisite: a program language. Information flows as applied to all areas of management functions. Creation, modification, and implementation of information systems, and the problems encountered during implementation of an information system. Data base concepts as applicable to information flows.

109. Data Communications (3). Prerequisite: a program language. Resource sharing; computer traffic characterizations; multiplexing; network structure; packet switching and other switching techniques; computer network examples; routing and flow control; satellite and ground radio packet switching; transmission media and methods; line control procedures; line capacity assignment; communication processors.

115. Office Automation (3). Prerequisite: IS 1 or equivalent. Study of how automated office equipment, highly-trained personnel and specified procedures affect information management. Emphasis on the phases of the information-processing cycle. Acquisition of a vocabulary and awareness of careers in office automation. Information processing applications on microcomputers. (2 lecture; 2 lab hours)

116. Word/Information Processing Management (3). Prerequisite: background in word/information processing concepts and automated office equipment operation. Application of word/information processing concepts and skills and management and supervision principles to effective management and supervision of word/information processing systems.

117. Records Management (3). Systematic analysis and scientific control in the creation, use, maintenance and disposition of business records. Emphasis on the importance of records management and the role of the records manager in introducing, implementing and maintaining a program.

120. Shorthand II (3). Prerequisite: IS 20 or one year high school shorthand. Review of theory and development of proficiency in writing and transcribing shorthand notes; speed and endurance in writing and transcribing shorthand notes. (2 lecture; 2 lab hours)

121. Transcription (3). Prerequisite: IS 120 (may be taken concurrently). Transcription from shorthand and machine dictation; development of production standards for office transcription. (2 lecture; 2 lab hours)

122. Office Services and Procedures (3). Prerequisite: IS 121. Duties and responsibilities of executive secretarial positions. (2 lecture; 2 lab hours)

151. Advanced Applications Software — BASIC (3). Prerequisite: IS 50; IS 53 or 54; Acct 4A–B; DS 71; IS 161 recommended. Advanced software development with an emphasis on structured programming, program debugging and efficiency, file handling, and logic structures. Documentation, software engineering, programming teams and elements of systems design. Applications using the BASIC language on mini and microcomputers. (2 lecture; 2 lab hours)

152. Advanced Applications Software — COBOL (3). Prerequisite: IS 54, Acct 4A–B, DS 71; IS 161 recommended. Advanced software development with an emphasis on structured programming, program debugging and efficiency, file handling, and logic structures. Documentation, software engineering, programming teams and elements of systems design. Applications using the COBOL language on large and medium size computers. (2 lecture; 2 lab hours)

160. Management Information Systems (3). Prerequisite: IS 50 or demonstration of computer literacy, and upper-division standing. Management concepts in the role/administration of information/information system functions in organizations; enhancement of management with computers; management of systems development: planning and budgeting, analysis, design, implementation and operation of computer-based systems; measurement of operating performance.

161. Information Systems Analysis (3). Prerequisite: IS 50, 53 or 54, Acct 4A–B, and upper-division standing. To develop a basic understanding of the systems approach to problem solving, systems development life cycle and system analysis. This course furnishes students with classical and structured documentation tools and techniques, logical systems specification and methods for analyzing systems.

163. Business Models and Simulation (3). Prerequisite: IS 53 or 54, DS 72, DS 173. Computer modeling of inventory, queuing, network, financial and planning problems. (2 lecture; 2 lab hours)

164. Computer Configurations (3). Prerequisite: IS 53 or 54 (a basic electronics course (I T 131) desirable). In-depth study of selection and installation of hardware and software of various computers; feasibility studies, comparisons of self-managed versus service bureau operations; comparison of competitive systems; costs of reprogramming; distributed systems and microcomputers.

165. File Organization and Data Base Systems (3). Prerequisite: IS 53 or 54; IS 161; IS 151 or 152 recommended. Data and storage structure; file design; approaches to data base management system design; use of generalized data base management systems. (2 lecture; 2 lab hours)

166. Information Systems Design (3). Prerequisite: IS 54, 161 and 165. Logical design of information systems, including the design of system-user interfaces, data base, program structure, program logic, and controls. Requires students to integrate these elements in designing a real-world system as a term project. (Former IS 162) (2 lecture; 2 lab hours)

168. Data Processing Management (3). Prerequisite: Acct 4A–B, 129, or 132; IS 53 or 54; POM 124 desirable. Theories, cost, and problems of operation of a computer center; standards; flow of work, scheduling, batching, spooling, multiprogramming and multiprocessing techniques as methods of control and operation.

189T. Topics in Information Systems (1–3; max total 6 if no topic repeated). Prerequisite: permission of instructor. Theory or application of information systems or information management as applied to current developments in the field.

190. Independent Study (1–3; max total see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only.

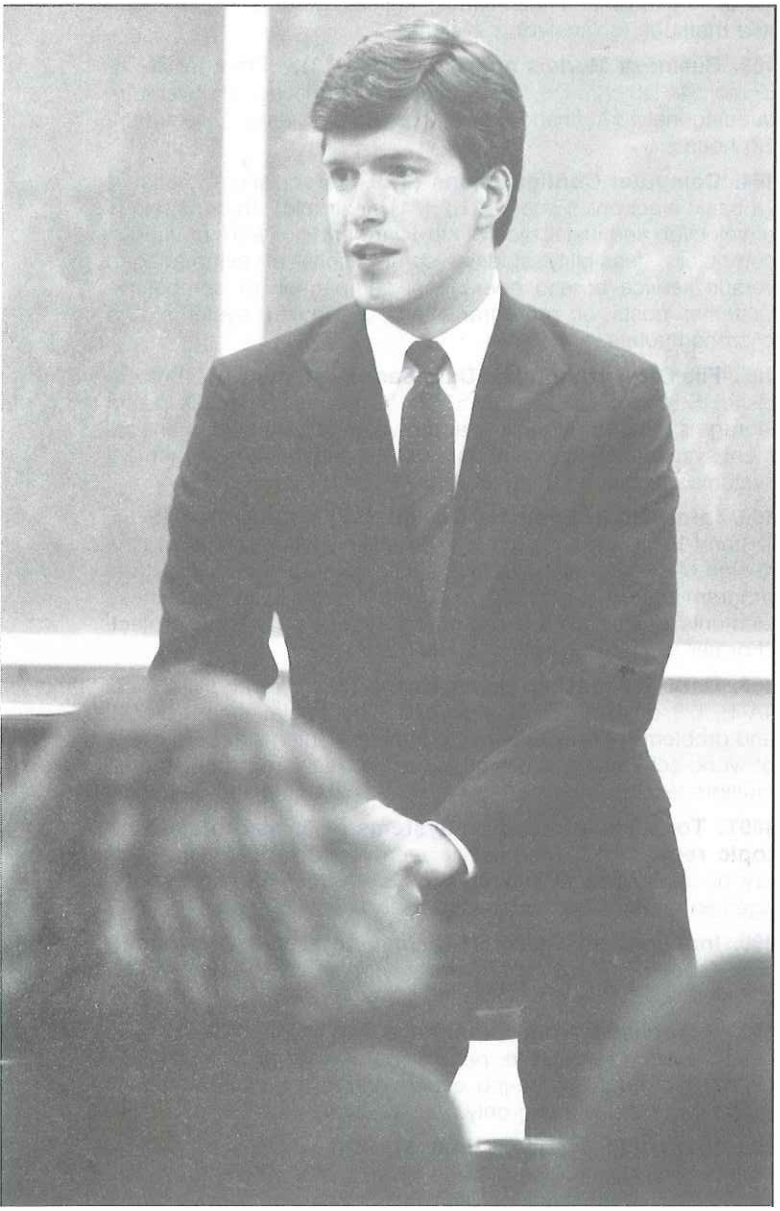
195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or a government agency and reports on firm's operations and suggested improvements. *CR/NC* grading only.

200. Series. Graduate courses are listed under *Business — Graduate Program.*

BUSINESS Management

School of Business and Administrative Sciences
Department of Management
Gerald L. Jones, Chair
Peters Business Building
(209) 278-2851

B.S. in Business Administration
Options:
Human Resource Management
Logistics/Operations Management
Management



The Department of Management offers three options (areas of emphasis) within the Bachelor of Science in the Business Administration degree program. These options are:

The *Human Resource Management Option* focuses upon the people who work in organizations. Consideration is given to personnel administration, labor relations and collective bargaining, employee compensation, and government legislation dealing with employees. The courses offered in this area will be of interest to those who wish to specialize in personnel work and to other students who wish to strengthen their understanding of people in organizations.

The *Logistics/Operations Management Option* is designed to furnish students with an integrated knowledge of transportation and physical distribution management, procurement, and production and operations management. This option provides a base of knowledge for those individuals who seek a challenge for the future and wish to become professionals in the field of logistics/operations management and prepares them for various exciting career opportunities in a field which is rapidly expanding.

The *Management Option* provides students with an opportunity to acquire skills and knowledge necessary for managing groups and organizations. Emphasis is given to development of skills in planning, organizing, leading and controlling, as well as the conceptual and analytical abilities which underlie the key managerial activities. Students may take electives in human relations, social issues, corporate/international issues, decision techniques and special management applications.

Faculty and Facilities

The faculty of the Department of Management is comprised of individuals who have studied and pursued business careers throughout the world. Well over a dozen specializations within the field of business administration are taught, researched, and shared with the business community by these professors. Case studies, experiential exercises, computer simulations, laboratory research, business community projects, guest speakers, and seminar discussions are just a few of the ways in which instructors provide the students with a real-world exposure to business. The combination of faculty expertise, teaching skills, research activities, and business experiences assures the student of receiving the best education possible in management.

Faculty

Gerald L. Jones, *Chair*

David C. Anderson
Ralph H. Bergmann
Harold L. Best
Chris A. Betts
Karen D. Bowerman
Gene E. Burton
Luis R. Calingo
Diana L. Gilbertson
Susan M. Halfhill
Harry G. Harris
Dewey E. Johnson
Mark J. Keppler
Jahanguir M. Moghaddam
Victor G. Panico
Joseph J. Penbera
Douglas B. Simpson
Richard D. Tellier
Manab Thakur
Charles H. Wetmore

Bachelor of Science Degree Requirements

Business Administration Major

A 40–43 unit business core provides students with a general background commonly acknowledged as furnishing the basis for effective management of business enterprises. The following courses are required of all business majors.

	Units
Core requirements	40–43
Acct 4A–B; B A 18; DS 73, 173; Fin 120; IS 50 (or demonstration of computer literacy); IS 160; POM 124; Mgt 110 or 104–106, 187; Mktg 100	
General Education requirements	54
Business majors must take Econ 40 (or Ag Ec 1) and Econ 50. Business students must also complete DS 71 or one semester of approved college mathematics beyond intermediate algebra.	
Electives	0–9
Option	24–30
(Select one of the three options outlined below.)	
Total for Business Administration degree	124–127

Options

The three options available to students are outlined below. The completion of the 24–30 units as required by the option, the General Education requirements, special course requirements, and the electives, which may include a minor, total the 124–127 units required for the Bachelor of Science in Business Administration.

Human Resource Management Option

	Units
HRM 150, 152, 153, 154, 157, 159	18
Elect from: B A 156; Econ 150; HRM 189T; Mgt 189T (by permission of HRM faculty); approved Independent Study or Internship (3 units maximum)	6
	24

Logistics/Operations Management Option

	Units
LOG 114, 136; POM 160, 177	16
Elect three courses from the following five areas	9–12
(1) System: IS 163; I T 119; Mgt 180	
(2) Human Resource Management: HRM 150; Mgt 127	
(3) Control: Acct 132; I E 111; I T 117	
(4) Analytical: DS 181; Fin 123; Mgt 130; Mktg 120 or 125	
(5) Logistics: I E 114; LOG 119; Mktg 138	
	25–28

Note:

1. With the approval of a Logistics/Operations Management adviser, one of the following may be substituted under any of the above five areas: HRM, LOG, Mgt, Mktg, POM 189T, 190, 193, 195.

Management Option

	Units
Mgt 180, 182	8
HRM 150	3
Mgt 131 or an international HRM 189T, Mgt 189T or POM 189T, as approved by the Department of Management	3
Select two courses from each of the following two categories (or the 12-unit Advanced Management Block Program, Mgt 102A-B-C-D)	12–16
(1) Decision Making Skills: Mgt 126, 128, 129, 130; LOG 114, 136; POM 160; Mktg 120 or 125, 176; DS 178, 181; Fin 123; Psych 149	
(2) Human Behavior Skills: Mgt 127; HRM 152, 153, 154, 157; B A 101 or 120 or Soc 149 or Psych 134 or Spch 167	
	26–30

Notes:

1. The following courses may be applied to either of the skills categories above with prior Department of Management approval (6 units maximum): HRM 189T; POM 189T; Mgt 189T, 190, 193, 195.
2. B A 120 and Soc 149 cannot be double counted as fulfilling both the General Education requirement and an elective within the option.

COURSES

Human Resource Management (HRM)

150. Administration of Personnel (3). Prerequisite: Mgt 104 and 106 or 110. Composition of labor force; acquisition and utilization of human resources in organizations; recruitment; selection; performance appraisal; motivation; compensation; communications; social issues and government influence. Individual and group projects; written and oral reports. (Former Ind R 150)

152. Labor Relations and Collective Bargaining (3). Prerequisite: HRM 150. Relations between employers and organized employee groups; organization, election, and certification procedures; techniques of collective bargaining; labor agreements; grievance handling; settlement of industrial disputes. Class discussion, student presentations. (Former Ind R 152)

153. The Staffing of Organizations (3). Prerequisite: HRM 150 or instructor's permission. In-depth study of major staffing issues such as recruitment, selection, performance appraisal, career development and discipline. Emphasis on practical application of issues for future managers and HRM professionals. Group projects, class discussion, guest lecturers and experimental exercises. (Former Ind R 153)

154. Compensation Administration (3). Prerequisite: HRM 150. Analysis of compensation programs for business, not-for-profit, and government organizations. Special attention given to job evaluation programs, motivation-to-work theory, micro and macro forces influencing compensation decisions. Case analysis; individual and group reports. (Former Ind R 154)

157. Legal Aspects of Human Resource Management (3). Prerequisite: HRM 150 or instructor's permission. Survey of law related to employment and personnel, including discrimination, wrongful discharge, safety and health requirements, and other government regulations. Attention given to prevention and resolution of legal complaints and to emerging and developing public policy issues. Oral presentations, discussion. (Former Ind R 157)

159. Seminar in Human Resource Management (3). Prerequisite: last-semester senior, HRM 152, 154, 157 (157 may be taken concurrently) and completion of upper-division writing skills requirement. Integration of various aspects of human resource management knowledge through utilization of previously acquired academic and practical experience; emphasis upon advanced problems in human resource management. Case analysis and discussion; individual and group report. (Former Ind R 159)

189T. Topics in Human Resource Management. (1–3; max total 9 if no topic repeated). Prerequisite: senior standing. Studies in personnel and labor relations, recruitment, selection, retention, compensation, employment law, and business ethics. (Former Ind R 189T)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading. (Former Ind R 190)

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only. (Former Ind R 193)

195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or government agency and reports on firm's operations and suggested improvements. *CR/NC* grading only. (Former Ind R 195)

200 Series. Graduate courses are listed under *Business — Graduate Program.*

Management (Mgt)

101. Basic Management Block (14). Meets School of Business and Administrative Sciences requirements for POM 124; Mgt 104 and 106 or 110; Mktg 100. Not open to students with credit in Mgt 104 and 106, 110; POM 124; Mktg 100. Prerequisite: first-semester junior, Econ 40, 50; Acct 4A; DS 73, application, and permission of instructor. Special integrative undergraduate seminar: 14 hours weekly; marketing, production, administration, organizational behavior. Small group projects; field trips and research; computer simulation; student planned and presented programs; business, government, academic guest presentations. Consult school or departmental office.

102A–B–C–D. Advanced Management Block (3–3–3–3). Can be substituted for some option requirements. Concurrent enrollment in A–B–C–D. Prerequisite: Permission of instructor. Undergraduate seminar integrating business disciplines, decision applications, models of local businesses, business simulation by computer, case analysis, student planned programs, individual and group presentations with executives and academicians, field trips, negotiations, group projects.

104. Administrative Principles of Management (3). Not open to students with credit in Mgt 110. Focus on planning techniques, organization theory, and ethical control processes in domestic and international business. Case analysis, management simulations, and written projects.

106. Behavioral Principles of Management (3). Not open to students with credit in Mgt 110. Focus upon the human dimensions and interpersonal behavioral skills of management, including motivation, job design, leadership, conflict handling, communication networks, and organizational change. Lecture: case analysis and written projects. Lab: small group exercises, behavioral lab studies, development of communication and interpersonal skills. (2 lecture; 2 lab hours)

110. Administration and Organizational Behavior (6). Not open to students with credit in Mgt 104 or Mgt 106. Development of administrative, interpersonal, and organizational skills of management; with emphasis on planning, organizing, controlling, human learning, perception, communication networks, job design, leadership, group dynamics reward systems, and the management of conflict, change, ethics, and stress. Lecture: case analysis and written projects. Lab: small group exercises, behavioral lab studies, development of communication and interpersonal skills. (5 lecture; 2 lab hours)

126. Managing Uncertainty and Ambiguity (3). Prerequisite: Mgt 104 and 106 or 110. Examination and analysis of constraints imposed on the decision process by uncertainty, complex changes, and ambiguity; the roll of intuition and creativity in addressing such circumstances; and techniques for developing intuition and creativity.

127. First-Line Supervision (3). Prerequisite: Mgt 104 and 106 or 110. Emphasis on motivating, communicating, counseling, training, managing time, evaluating performance, and understanding the worker. Guest speakers, role-playing and incident reports.

128. Problems in Small Business Management (3). Prerequisite: senior standing. Special problems of small businesses: initiation, financing, operations. Class projects: studying local business operations; preparing business plans and financial requests.

129. The Entrepreneurial Manager (3). Prerequisite: Mgt 104 and 106 or 110. Aspects of business evolution and product development (intrapreneurship) from inception through interdisciplinary (technological, marketing, financial, etc.) feasibility analysis to implementation and reward techniques are studied through cases and applied techniques. Course includes historical as well as current international approaches.

130. Managerial Economics (4). Prerequisite: Fin 120; POM 124; Mktg 100. Economic analysis of management problems, applying an integrated model of the firm to: setting goals and standards for coordination, evaluation and control; allocating the firm's resources; organizing for competition and cooperation; analyzing market structure; and creating a management information system. (3 lecture; 2 lab hours)

131. International Management (3). Prerequisite: Mgt 104 and 106 or 110; or permission of instructor. A review of the unique issues, problems and challenges of managing enterprises in an international environment. Comparative analysis of management styles and cultures, managerial processes and strategy formulation. Focuses on American, European and Japanese enterprises. Seminar discussion and cases.

180. Seminar in Management Theory and Organization Design (4). Prerequisite: Mgt 104 and 106 or 110. Organizations as open systems functioning in the external environment; organization development as a planned intervention emphasizing effective implementation of system changes, integrating mechanisms in response to perceived contingencies; and strategic issues of organizational life cycles.

182. Seminar in Applied Management Techniques (4). Prerequisite: Mgt 104 and 106 or 110. Implementation of management strategy in the human context of organizations; the organizational context which shapes behavior; climate and culture as an organization-wide process; and change, power and conflict in the organization as a systematic entity.

187. Seminar in Business Strategy (3). Prerequisite: last-semester senior, completion of School of Business and Administrative Sciences core requirements, and completion of upper division writing skills requirement. Integration of various fields of knowledge through utilization of previously acquired academic and practical experience; emphasis upon decision making under conditions of uncertainty, and experience with international policy formulation and implementation.

189T. Topics in Management (1–3; max total 9 if no topic repeated). Prerequisite: senior standing. Studies in management, organizational theory, organizational behavior, production, transportation, business administration, special management and organizational problems.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only.

195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or government agency and reports on firm's operations and suggested improvements. *CR/NC* grading only.

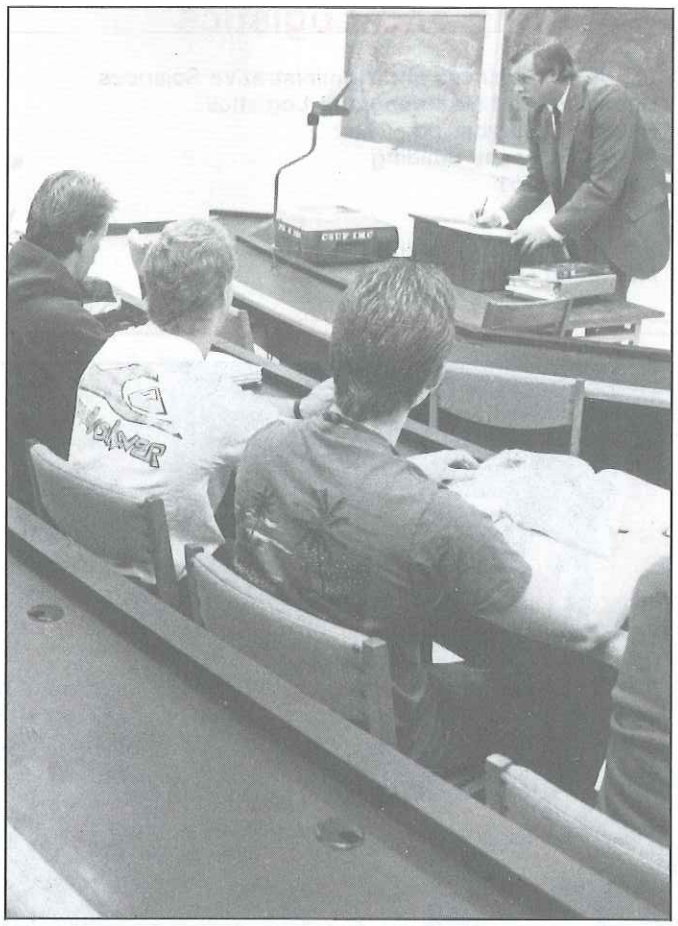
200. Series. Graduate courses are listed under *Business — Graduate Program.*

Production/Operations Management (POM)

124. Production/Operations Management (4). Prerequisite: DS 173 (may be taken concurrently), Mgt 104 or 110. Operations systems and problems; facility location and design; materials handling; operation planning and control; inventory control; product development; quality control; methods analysis and job design; work measurement. Lecture discussion; application of quantitative methods in solution of national and multinational operations problems; computer simulation. (Former Mgt 124; LOM 124)

160. Production/Operations Planning and Control (4). Prerequisite: POM 124 or permission of instructor. Material requirements planning; capacity planning and control; production/operations activity planning and control; lead time management; master production scheduling; forecasting; maintenance and safety; and project planning and control. (Former LOM 160)

177. Problems in Production/Operations Management (4). Prerequisite: LOG 114, 136; POM 160. Integration of various elements of logistics/operations management with each other and with other functional areas of a business system; emphasis upon American and worldwide industries, logistics/operations goals and strategies, integrated logistics/operations management, and multi-plan and international logistics/operations management. (Former LOM 177)



189T. Topics in Production and Operations Management (1–3; max total 3 if no topic repeated). Prerequisite: senior standing or permission of instructor. Topics in production and operations management. (Former LOM 189T)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading. (Former LOM 190)

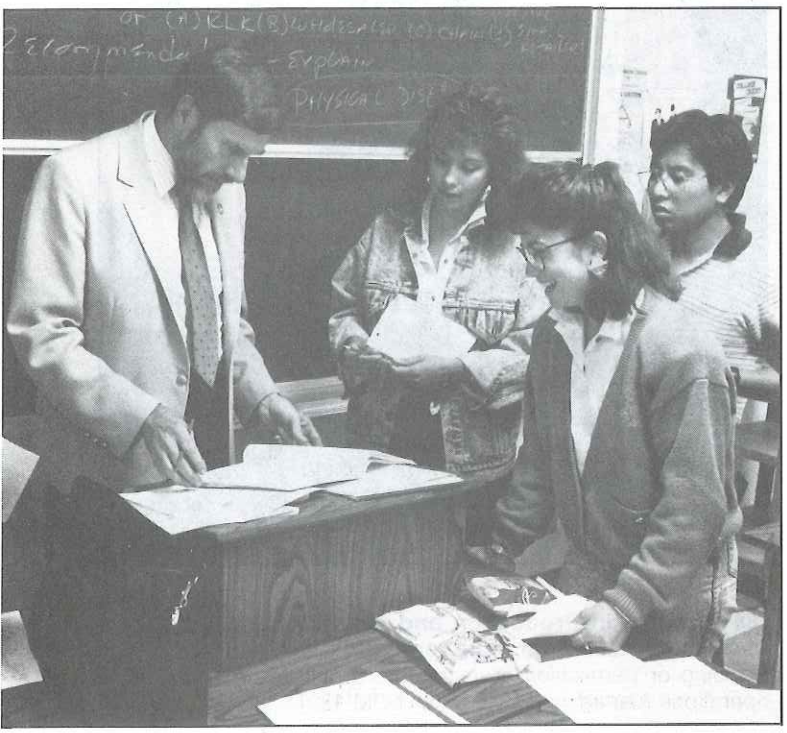
193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only. (Former LOM 193)

195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or government agency, and reports on firm's operations and suggested improvements. *CR/NC* grading only. (Former LOM 195)

BUSINESS
Marketing and Logistics

School of Business and Administrative Sciences
Department of Marketing and Logistics
Richard D. Nordstrom, Chair
Peters Business Building
(209) 278-2851

B.S. in Business Administration
Marketing Option



The Department of Marketing and Logistics offers an option (area of emphasis) in marketing and assists in offering the Logistics/Operations Management Option within the Bachelor of Science in the Business Administration degree program.

The *Marketing Option* is designed to explore the primary areas of buyer behavior, market segmentation, marketing research, channel management, physical distribution, pricing, and strategic marketing planning. It also gives the student the choice of examining promotion, sales and sales administration, marketing management, retailing, and psychology of personal persuasion.

Faculty and Facilities

The faculty of the Department of Marketing and Logistics is comprised of individuals who have studied and pursued business careers throughout the world. Case studies, experiential exercises, computer simulations, laboratory research, business community projects, guest speakers, and seminar discussions are just a few of the ways in which instructors provide the students with a real-world exposure to business. The combination of faculty expertise, teaching skills, research activities, and business experiences assures the student of receiving the best education possible in marketing and logistics.

Faculty

Richard D. Nordstrom, *Chair*

Gerald O. Bryan
Douglas A. Cords
David S. Halfhill
Reza Motameni
Richard L. Pinkerton
William E. Rice
Charles S. Sherwood
Louis D. Volpp

Bachelor of Science Degree Requirements

Business Administration Major

A 40–43 unit business core provides students with a general background commonly acknowledged as furnishing the basis for effective management of business enterprises. The following courses are required of all business majors.

	Units
Core requirements	40–43
Acct 4A–B; B A 18; DS 73, 173; Fin 120; IS 50 (or demonstration of computer literacy); IS 160; POM 124; Mgt 110 or 104–106, 187; Mktg 100	
General Education requirements	54
Business majors must take Econ 40 (or Ag Ec 1) and Econ 50. Business students must also complete DS 71 or one semester of approved college mathematics beyond intermediate algebra.	
Electives	0–9
Marketing Option	24
Mktg 102; LOG 114 or Mktg 115; Mktg 120 or 125; Mktg 188	(16)
Elect two of the following: Mktg 130, 132, 134; 136 or 138; 176 or 195	(8)
Total for Business Administration degree	124

Notes:

1. Credit for both Mktg 136 and 138 is permitted, but one of the two must be a free elective outside the requirements of the marketing option.
2. Students desiring more depth may also take Mktg 189T, 190, 193. These would count as free electives outside the requirements of the marketing option.

COURSES

Marketing (Mktg)

100. Marketing Concepts (4). Prerequisite: Econ 40, 50. Study/analysis of the challenges and problems faced by individuals, organizations (profit and nonprofit) who attempt to expedite and facilitate exchange in a dynamic environment. Emphasis on strategic marketing planning and the decision-making process in the marketplace. (3 lecture; 2 lab hours)

102. Buyer Behavior (4). Prerequisite: DS 73; Mktg 100. This course leads to the understanding of consumers and industrial buyers as a guide for more effective marketing. A survey of appropriate research findings and methods from marketing, economics, sociology, psychology, and anthropology are applied to aspects of marketing decision making. (3 lecture; 2 lab hours)

115. Channel Marketing (4). Prerequisite: Mktg 100. Analysis of the coalition of merchants, agents, and other institutions which together constitute the channel of distribution for consumer and industrial goods; emphasis on designing, operating, controlling, and evaluating channel structures in a competitive environment. Case studies and problem solving.

120. Marketing Research (4). Prerequisite: DS 173; Mktg 102. Fundamentals of market and marketing analysis, research procedure, methods of analysis; individual and group problem analysis and presentation of results; computer simulation. (3 lecture; 2 lab hours) (Former Mktg 104)

125. Analysis of Marketing Operations (4). Prerequisite: DS 173; POM 124; Mktg 102. Marketing control systems and reporting systems, and use of external secondary data for creating analytic and simulation models to identify key marketing problems, and opportunities, and for developing solutions. Computer spreadsheets and statistical software tools are applied to model building. (3 lecture; 2 lab hours)

130. Retail Management and Merchandising (4). Prerequisite: Mktg 102. Location, price, and promotion topics are enhanced with the buying and merchandising process, including buying planned stocks, style merchandising, and accounting and controlling systems.

132. Promotion Practices and Principles (4). Prerequisite: Mktg 102. The focus is on promotion as a communications process and the integration of promotional elements into the total strategy of the firm, keeping in mind competitive strategies and the constraints imposed by the major social and ethical issues surrounding promotional practices. (Former Mktg 140 and 142)

134. Product Marketing and Management (4). Prerequisite: DS 173; Mktg 102. This course investigates the various processes organizations employ in order to develop new products/services. Students will complete a term project which simulates the new product development process that would ideally be pursued in an actual situation. (Former Mktg 112 and 117)

136. Sales Administration and Personal Selling (4). Prerequisite: Mktg 102. Techniques of personal persuasion, behavioral sciences methods, selection training, and supervision of sales staff are integrated into the strategic marketing concepts. Role playing and case analysis. (Former Mktg 155)

138. Psychology of Personal Persuasion (4). Prerequisite: Mktg 100. Behavioral science approach to personal selling. Emphasis on analysis of psychological aspects of consumer decision-making and consumer attitudes toward the salesman that affect success. Case analysis, individual and group presentations. (3 lecture; 2 lab hours) (Former Mktg 150)

176. International Marketing (3). Prerequisites: Mktg 100; B A 174. Examination and evaluation of business policies and practices of firms engaged in world trade; the marketing area; organization, product, channels of distribution, marketing research, demand creation and other management problems. General Education CAPSTONE Cluster.

188. Marketing Strategy (4). Prerequisite: LOG 114 or Mktg 115; POM 124; Mktg 120 or 125. Last semester senior standing recommended. Primary emphasis upon analysis of situations/opportunities, development of problem-solving scenarios, and resultant marketing plans. Computer simulations, in-depth problem-solving research study, case analyses, and discussions. (3 lecture; 2 lab hours) (Former Mktg 109)

189T. Topics in Marketing (1–3; max total 6 if no topic repeated). Prerequisite: senior standing or permission of instructor. Topics in advertising, consumer behavior, distribution, industrial procurement, marketing research, retailing, wholesaling.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only.

195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or government agency and reports on firm's operations and suggested improvements. *CR/NC* grading only.

200. Series. Graduate courses are listed under *Business — Graduate Program.*

Logistics (LOG)

114. Transportation and Physical Distribution Management (4). Prerequisite: Mktg 100. Systems approach to physical distribution activities aimed at minimizing cost and maximizing customer service. Emphasis on transportation system characteristics and the role of warehousing, inventory control, order processing, and materials handling in logistics management. Case studies and simulations. (Former Mgt 146, 147; LOM 114)

119. Carrier and Traffic Management (3). Prerequisite: LOG 114. New tools and techniques in carrier management, physical distribution management, carrier-shipper cooperation; trends in intracarrier and intercarrier competition, pricing and regulatory philosophy. Case problems; computer simulation; individual and group problem solving. (Former Mgt 148; LOM 119)

136. Introduction to Procurement (4). Prerequisite: POM 124 or permission of instructor. Procurement planning, policies, and procedures; procurement organization; sources of supply; pricing; contract negotiation; value analysis; traffic management; quality assurance; inventory management; public procurement; and legal and ethical aspects of procurement. (Former LOM 136)

189T. Topics in Logistics (1–3; max total 3 if no topic repeated). Prerequisite: senior standing or permission of instructor. Topics in procurement, logistics, transportation, physical distribution. (Former LOM 189T)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading. (Former LOM 190)

193. Supervised Work Experience (1). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Learning through on-the-job experience in a business. Written reports. *CR/NC* grading only. (Former LOM 193)

195. Internship (3; max total 6). Open only to business majors. Prerequisite: permission of instructor. Workstudy: Student holds responsible position in business or government agency, and reports on firm's operations and suggested improvements. *CR/NC* grading only. (Former LOM 195)

BUSINESS
Graduate Program

School of Business and Administrative Sciences
Graduate Business Program
Manuchehr Shahrokhi, Director
Peters Business Building, Room 183
(209) 278-2107

Master of Business Administration (M.B.A.)
M.S. in Business (M.S.B.)
M.S. in Accountancy (M.S.A.)



The School of Business and Administrative Sciences (SOBAS) offers programs for the M.B.A., M.S.B. and M.S.A. degrees. The M.B.A. degree is designed to prepare students for careers in the middle and upper levels of the management of business organizations, public corporations, educational systems, government and nonprofit institutions, and agricultural enterprises. The Master of Science in Business is offered for those graduate students who wish to specialize in certain approved areas of study at the graduate level. Either program may be used to increase the competency of teachers in secondary schools and community colleges. The Master of Science in Accountancy is designed for those persons who wish to advance their careers in accounting.

Admission. The M.B.A., M.S.B. and M.S.A. programs are open to college graduates with at least a bachelor's degree (B.S. or B.A.) who show intellectual promise and ability to perform at a satisfactory level during their graduate studies. To enter the SOBAS's graduate degree program, an entry index of 1050 is required. This index is computed by multiplying the student's undergraduate grade point average (GPA) by 200, plus the total score on the Graduate Management Aptitude Test (GMAT). A score at or above the 25th percentile on both the quantitative and verbal portions of the GMAT is also required. Students who perform between the 25th and 50th percentiles on either the quantitative or verbal portion of the GMAT are required to take additional prescribed courses and earn a grade of *B* or better in each course. In cases of exceptions to the minimum entry index, the SOBAS's Graduate Committee will consider evidence of unusual motivation, career maturity and past successes. Acceptance by the university for graduate study does not imply acceptance by the School of Business and Administrative Sciences. Only students who meet all of the above criteria are eligible for the school's graduate programs. Special application forms in addition to those required by the university are required by the school.

Outstanding last-semester seniors can take 200-series courses if they possess a minimum overall GPA of 3.0, have applied for graduation, and have secured the authorization of the dean of graduate studies, the director of the graduate business program, and the permission of the instructor.

Before a student can enroll in a graduate (200-series) course, graduate classified standing or permission of the graduate business director is required. Students who have met all admission requirements are eligible for placement in classified standing when admitted to the graduate program. Teaching credential candidates may take Bus 280 and 282 in unclassified standing when approved by the business credential adviser. Students who are classified in other master's degree programs at CSUF and who have met the prerequisites may enroll in graduate business courses. Proof of classified standing is required.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Project.*)

Master of Business Administration Degree Requirements

The M.B.A. degree is awarded upon satisfactory completion of a 33-unit program of study. Students are required to have completed foundation courses in business administration (see below). Students who lack any of the required foundation courses must complete the appropriate courses.

	Units
I. Program prerequisites	
(Foundation requirements — to be determined based on student's academic preparation): Bus 202, 205, 207, 208, 209, 211, 214, 216, 217, 218 (or their equivalents)	0–33
II. M.B.A. course requirements	
Core courses*: Bus 241, 242, 243, 244, 245, 246, 247, 248	24
and	
Bus 298 or 299**	6
Approved electives	3
Total	33

* Students with an undergraduate degree in business may be able to waive one core course corresponding to their major.
** Students electing Bus 299 must have completed Mgt 187.

Master of Science in Business Degree Requirements

The M.S.B. degree is offered for students who wish to specialize in one particular area of business at the graduate level. The M.S.B. requires a minimum of 30 units. Application for approval of individual programs must be made through the graduate business director or the SOBAS departments.

Foundation requirements	*Units*
Bus 202, 205, 207, 208, 209, 211, 214, 216, 217, 218 (or their equivalents)	0 -33

M.S. Business Core requirements

An approved research course, Bus 241, 299	12
Approved electives *	18
Total	30

* A maximum of 9 approved units of upper-division undergraduate work may be counted toward the 18 elective units. A maximum of 6 units of work may be taken outside the School of Business and Administrative Sciences.

Master of Science in Accountancy Degree Requirements

The M.S.A. degree is intended for students desiring advanced theoretical and practical study in the field. The program is based upon a strong foundation in business and accounting subjects. The program is designed for those persons who wish to advance their careers in public accounting, in controllership, and accounting executive positions in business, government and other nonprofit organizations, and in consulting firms.

Students are required to have the equivalent of an undergraduate degree in business with a major in accountancy or to remove any deficiencies in these areas. The program calls for 30 additional units when these requirements have been met. A comprehensive examination is required of all students prior to the completion of the program.

Specific prerequisite courses or their equivalents required:

	Units
Bus 202, 205, 207, 208, 209, 211, 214, 216, 217, 218	0–33
Acct 120 A–B, 132, 144, 146, 162, 167	0–28

M.S.A. Core and Elective requirements

Financial Accounting Option:	
Core: Bus 260, 263, 264, 265	12
Other Required Courses:	
Bus 244, 261, 276	9
Electives From:	
Bus 235, 241, 243	3
One Approved Course in Taxation **	3
One Approved Elective **	3
Total	30
Taxation Option:	
Core: Bus 260, 263, 264, 265	12
Other Required Courses:	
Bus 270, 277, 278	9
Electives From:	
Bus 269T, 279, Acct 145, or another approved graduate business course numbered between 220 and 299 **	9
Total	30

** Lists of approved electives are available in the Graduate Business Program Office.

GRADUATE COURSES — Business and Administrative Sciences

(See Course Numbering System)

Business (Bus)

Note: Teaching credential candidates may take Bus 280 and 282 in unclassified standing when approved by the graduate business director. Business graduate courses are available for a letter grade only.

202. Economics for Business Decisions (3). Not required of students with credit in Econ 40 and 50. Microeconomic decisions; product, service, and factor markets; risk, uncertainty, and profits; macroeconomic framework of business decisions.

205. Financial and Managerial Accounting (3). Not required of students with credit in Acct 1A and B or 4A and B. Financial accounting; statement analysis and interpretation; transaction analysis; partnerships and corporations; taxation; financial reporting; managerial controls, information systems, budgeting; costs, capital budgets.

207. Quantitative Foundations for Business Decisions (3). Not required of students with credit in DS 71. Functional representations of business relationships; variable rates of change, marginal analysis and optimization of business functions; analysis of business data arrays.

208. Quantitative Methods in Business (3). Not required of students with credit in DS 73 and 173. Statistical analysis in business, tests of hypotheses, time series, correlation analyses, index numbers, estimation models, and Bayesian statistics in business decision making. (2 lecture, 2 lab hours)

209. Computers and Programming (3). Not required of students with credit in IS 50. Computing algorithms, statistical and other software packages, data processing, programming languages. (2 lecture, 2 lab hours)

211. Legal Environment of Business (3). Not required of students with credit in B A 18. Basic legal concepts, nature of the legal system, administrative law, law of contracts and of agency, antitrust law and legal research.

214. Organization and Management Theory (3). Not required of students with credit in Mgt 110 or Mgt 104 and 106. Organizational theory, structure and forms of organization, authority, leadership, group dynamics, policy formulation; conflict resolution, organizational control.

216. Operations Analysis (3). Not required of students with credit in POM 124. Prerequisite: Bus 202, 207, 208 and 214 recommended. Operations theory and methods; operations planning and control; methods analysis, work measurements; materials handling and control, facilities location and layout; application of statistical techniques and electronic data processing; relationships with other functional areas of management.

217. Marketing Organization and Policies (3). Not required of students with credit in Mktg 100. Prerequisite: Bus 202, 205, 207; Bus 208 (or concurrently). Environmental factors for marketing, elements of marketing and marketing systems, marketing activities and strategies of the firm; evaluating marketing programs and systems.

218. Principles of Finance (3). Not required of students with credit in Fin 120. Prerequisite: Bus 202, 205; Bus 207 recommended. Impact of uncertainty and environmental considerations upon the finance function. Financial problems and policies; working capital management, capital budgeting, cost of capital, and dividend policy. Problems and cases.

221. Seminar in Business Research (3). Prerequisite: completion of all foundation courses (or concurrently). Methods of research; applications to business problems.

229. Seminar in Organizational Strategy (3). Prerequisite: completion of foundation requirements (courses); completion of M.B.A. core or concurrently completing M.B.A. core. Examination of strategic concepts, techniques and applications in both

profit and not-for-profit organizations. Strategy evaluation, analysis, formulation, execution, administration and control. Case studies and/or field studies.

232. Seminar in Money and Capital Markets (3). Prerequisite: Bus 218. Analysis of money and capital markets, their organization and role in economic activity.

235. Seminar in Managerial Economics (3). Prerequisite: Bus 202, 205, 207, 208, 217. Economic analysis of managerial problems; theory of the firm.

236. Seminar in Risk Management and Insurance (3). Prerequisite: Bus 202, 211, 218. Use of insurance as a risk management tool; covers major aspects of the insurance mechanism, including analysis of basic life and non-life insurance contracts. Considers various noninsurance methods of handling nonspeculative financial risks as well as the traditional insurance methods.

240. Seminar in Marketing (3). Prerequisite: Bus 217. Critical review of the literature of marketing, special reports and research dealing with marketing institutions and organization, and marketing functions.

241. Seminar in Leadership and Organizational Behavior (3). Prerequisite: Bus 214. This seminar investigates the significance of leadership and successful management in modern organizations. The influence of leadership is examined as central to managing the behavioral dynamics of individuals, work groups and organizations. (Former Bus 223)

242. Seminar in Marketing Management (3). Prerequisite: completion of all foundation courses of the M.B.A. program. Analysis of communications, distribution, pricing and product policy of the strategic business unit., Planning, budgeting and implementing marketing programs based on analysis and research on the market, the competitive structure and the marketing process.

243. Seminar in Quantitative Decision Making (3). Prerequisite: Bus 207, 208, 209 and 216. Addresses the quantitative decision-making process as well as the research methods that allow the prospective manager to understand the various techniques for data collection, analysis and interpretation that are needed in the decision-making process. (Former Bus 228)

244. Seminar in Financial Management (3). A practical and applications approach to the theories, concepts and techniques of financial management with emphasis on financial analysis and planning, working capital, capital budgeting, capital structure, mergers and acquisitions, LBOs, and international financial management. Computer applications stressed. (Former Bus 224)

245. Seminar in Accounting Control and Reporting (3). Prerequisite: Bus 205, 208, 218. In-depth consideration of several topical areas in accounting analysis as related to both profit and not-for-profit organizations, with emphasis on currently controversial issues including international implications. Analysis includes budgetary planning, cost analysis, internal control and case studies. (Former Bus 226)

246. Seminar in Management Information Systems (3). Prerequisite: Bus 209. Develops an overall framework for analyzing and modeling information needs by organizations. Provides the theoretical and practical aspects of design and implementation of computer-based planning, control, and decision support and expert systems. (Former Bus 259)

247. Seminar in International Business (3). A seminar on the theories, concepts and techniques required for effective management of international business. The topics include business in the global setting, international trade and investment issues, cross-cultural analysis, international management, accounting, marketing, finance and multinational corporations (MNCs). (Former Bus 275)

248. Seminar in Regulatory and Ethical Environment of Business (3). Prerequisite: Bus 211. Analytical basis for evaluating state, national and international business regulation. Study of policy formulation processes. Emphasis on ethical considerations and the goals of major economic and social regulation; e.g., ratemaking, antitrust law, securities regulation, bankruptcy, consumer/environmental protection, employment law. (Former Bus 237)

250. Seminar in Personnel and Labor Management (3). Activities and techniques that comprise the functions of human resource management — recruitment, selection, training, evaluation, compensation, and state and federal legislation. Development and practice of labor-management relations. International comparisons in all segments of the course.

252. Seminar in Labor Relations (3). Prerequisite: Bus 214. Current trends in labor relations theory and practice; labor relations systems; contract negotiations; dispute prevention and settlement; role of government; applications of behavioral sciences; individual research.

255. Seminar in Operations Management (3). Prerequisite: Bus 216. Current operations management theories and problems; critical analysis and review of present practices and theories.

257. Seminar in Business Communication (3). Investigation and analysis of the communication process as it relates to managerial effectiveness.

260. Seminar in Accounting Theory (3). Prerequisite: Acct 120A and B. A historical perspective of the development of accounting theory. An evaluation of the objectives and standards of financial reporting as they are applied in contemporary income determination and asset valuation.

261. Accounting for Non-Profit Organizations (3). Prerequisite: Bus 205. Accounting for various types of funds as applied to governmental and other not-for-profit organizations. Budgets and accounting controls; revenues and appropriations, expenditures and encumbrances; accounting statements and reports.

262. Seminar in Programming (3). Prerequisite: Bus 209. Advanced techniques of sorting, file maintenance and information systems, controls and teleprocessing directed toward business applications.

263. Seminar in Cost Accounting (3). Prerequisite: Acct 132 or Bus 245. The development, interpretation, and uses of accounting reports and supplementary information for management planning, control, and decision making. Topics include cost-volume-profit analysis; linear programming, capital budgeting; inventory models; the use of standards, budgets, and variance analysis for planning and control purposes; divisional performance; and transfer pricing issues.

264. Seminar in Auditing (3). Prerequisite: Acct 162. An advanced study of the philosophy, theory, and practice of auditing with special emphasis in recent developments, and cases involving ethical and legal responsibilities, statistical sampling methods, using the computer, and reliance on internal control; operational auditing.

265. Seminar in Information Systems (3). Prerequisite: IS 161, Acct 146, or Bus 246. Theory of systems and information as they relate to design, management and control of business systems. Study of informatioin and systems as resources to be managed.

266. Seminar in Information Systems Management (3). Prerequisite: IS 161, Acct 146, or Bus 246. Study of the hardware, software and behavioral issues relating to the design, acquisition, implementation and management of information systems technology.

268. Regression, Correlation, Factor Analysis (3). Prerequisite: Bus 208. Conditional, marginal, and joint probability distributions; statistical dependence; simple, multiple, linear and nonlinear regression models; correlation analysis; analysis of variance and regression; introduction to Bayesian decision theory.

269T. Topics in Tax Planning (3). Prerequisite: Acct 144; Acct 145 (or concurrently). An in-depth examination of tax planning and decision making with respect to income, estate, and gift taxes; tax research and review of current cases involving application of tax laws to individuals, partnerships, corporations, and fiduciaries. Opportunities in special industries such as agriculture, real estate, insurance, and natural resources.

270. Estate Planning (3). Prerequisite: Acct 144 and 145. Estate planning techniques to maximize wealth and minimize taxes. Indepth discussion of Federal and State systems for taxing transfers. Theory, practice and legal requirements for reporting by fiduciaries of estates and trusts.

272. Seminar in International Finance and Investment (3). Prerequisite: Bus 244. An advanced study of theories and techniques in global finance and investment. The topics include the international financial system, currency markets, risks and exposure management, balance of payments, political risks, international banking, international capital markets, eurocurrencies, portfolio and foreign direct investments.

276. Seminar in Current Accounting and Reporting Issues (3). Prerequisite: Acct 120A and B. A comprehensive examination of currently effective authoritative pronouncements that govern financial accounting. Included are pronouncements and proposals of the AICPA, the FASB, the AAA, the SEC, and related accounting literature.

277. Taxation of Corporations and Shareholders (3). Prerequisite: Acct 144; Acct 145 (or concurrently). A detailed study of tax problems of corporations and their shareholders. Areas covered include organization, capital structure and taxation of corporations; dividends, nonliquidating distributions, stock redemptions, and partial and complete liquidations; and corporate reorganizations.

278. Taxation of Partnerships and Subchapter S Corporations (3). Prerequisite: Acct 144; Acct 145 (or concurrently). An examination of fundamental legal concepts, technical rules, and computational procedures relating to federal taxation of partnerships and partners and Subchapter S Corporations. Areas of emphasis include partnership formation, operations, and termination.

279. Taxation of Property Transactions and Accounting Methods (3). Prerequisite: Acct 144; Acct 145 (or concurrently). A comprehensive coverage of property transactions and tax accounting methods including definition, realization, recognition, and computation of capital gains and losses, various tax accounting methods and planning opportunities relative to individuals and corporations.

280. Seminar in Business Education (3). Study of advanced problems in business education.

282. Seminar in Business Curricula (3). Objectives, principles, and curricula of business in secondary schools, and colleges and universities; evaluation and trends of current programs.

289T. Seminar in Business Topics (3; max total 9 if no topic repeated). Prerequisite: 9 units of 200 courses. Theory and developments in accounting, administration and organization, business education, communications, consumer economics, finance, industrial and regional studies, international business, law, management, marketing, personnel and industrial relations, quantitative studies, real estate and urban economics, records management, resource economics, risk and insurance, or transportation.

290. Independent Study (1–3; max total 6). See *Academic Placement — Independent Study.* Prerequisite: completion of 9 units of Core and Electives; permission of director and instructor. Approved for *SP* grading.

292. Readings in Business (2–3; max total 6). Prerequisite: completion of 9 units of Core and Electives; permission of director and instructor. Approved for *SP* grading.

298. Management Colloquium (6). Prerequisite: completion of M.B.A. core; Bus 241, 242, 243, 244, 245; and last semester standing, or concurrently completing M.B.A. core. See *Criteria for Thesis and Project.* Examination of the work and problems general managers of business units face as chief strategists and organization builders. Independent analysis of an operating industry, business, or a not-for-profit organization or a principal functional area of an organization. Case studies and field research project. Approved for *SP* grading.

299. Thesis (3 or 6). Prerequisite: completion of master's core or concurrently completing master's core. See *Criteria for Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Elective for Master of Business Administration. Approved for *SP* grading.

IN-SERVICE COURSES

(See *Course Numbering System.*)

367. CPA Review (2–4).

380T. Topics in Business (1–3; may be repeated if no topic repeated).

381. Instructional Procedures in Vocational Business Education (2–3).

385. Bridging the Gap (2–4).

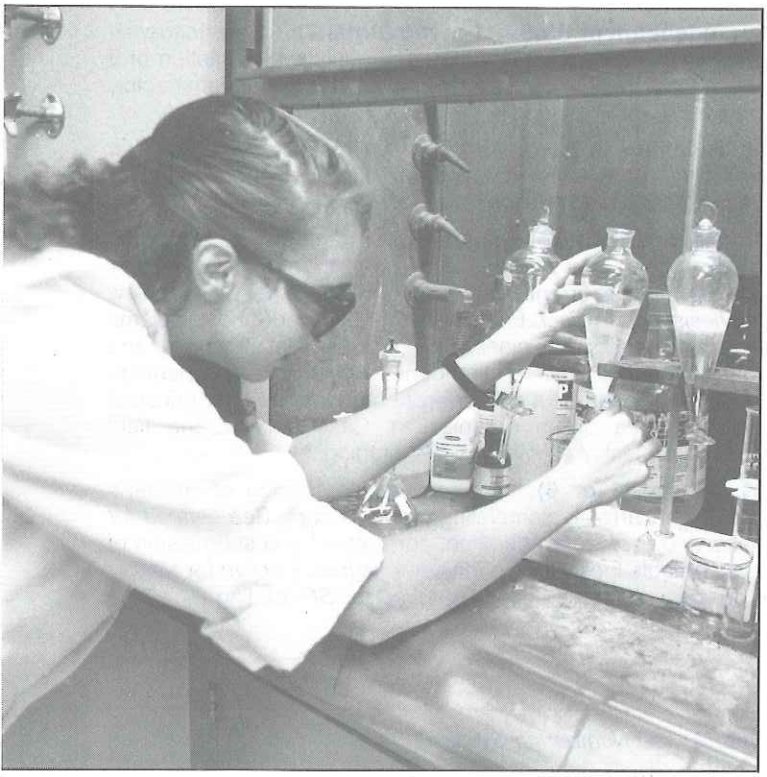
389. Workshop in Business Education (1–6; max total 6). Credit may not exceed 1 unit per week of workshop activity. Open only to experienced teachers. Study and critical analysis of problems in content and teaching in secondary school business education.

398. Business Internship (1–6; max total 6). Designed for graduate students who need or desire supervised work experience. *CR/NC* grading only.

Chemistry

School of Natural Sciences
Department of Chemistry
David L. Zellmer, Chair
Science Building, Room 380
(209) 278-2103

B.A. in Chemistry
B.S. in Chemistry
Minor in Chemistry
M.S. in Chemistry
Single Subject Teaching Credential in Physical Science



The Chemistry Department provides (1) undergraduate training in chemistry for students planning professional careers in chemistry, biochemistry and allied professions, and for those contemplating graduate work for advanced degrees; (2) undergraduate training in chemistry for those planning careers in professions such as medicine, chiropractic, dentistry, pharmacy, etc.; (3) participation in the preparation of teachers of chemistry and the other physical sciences in the teaching credential programs; (4) teaching of the basic chemical sciences required by students majoring in related fields such as physics, biology, nursing, engineering, geology, agriculture, home economics and criminology; (5) stimulation of interest in and understanding of the achievements and contributions of chemistry to our civilization for nonscience students, as a part of general education; and (6) graduate instruction in chemistry for the Master of Science degree for students who intend to enter the chemical industry, pursue further advanced study, or who wish to improve their qualifications as teachers in secondary schools and community colleges.

The Bachelor of Science degree program in Chemistry is accredited by the American Chemical Society. Students who satisfactorily complete the program are recommended by the department for certification as graduate chemists by the American Chemical Society. Students completing the Bachelor of Arts degree may be recommended for certification by completing additional requirements of the American Chemical Society.

Faculty

Twenty-two full-time Ph.D. members are in the Department of Chemistry. Our faculty provide excellent research opportunities in analytical, biochemistry, inorganic, organic and physical chemistry. The broad interests within the faculty have resulted in interdisciplinary research projects in collaboration with scientists and professors in other science areas: agricultural chemistry, biotechnology, clinical chemistry, forensics chemistry, chemical physics, enology, nutritional science and molecular biology. Research projects have involved local facilities such as the California State Crime Laboratory, Fresno Community Hospital, USDA Research Station, U.S. Veteran's Administration Hospital, U.S. Forest Laboratory and Valley Children's Hospital.

Facilities

All upper-division and graduate chemistry laboratories and support areas are housed in our science building completed in 1976. Eight four-station graduate laboratories are well equipped, with access to modern instrumentation. Instrumentation in the department includes: Varian EM 360 and EM 390 NMR spectrometers, Finnegan GC-MS, atomic absorption spectrometers, Nicolet MX-1 Fourier Transform IR (FTIR), liquid scintillation counter, Pye-Unicam, Cary 14 and Cary 17D UV-VIS spectrophotometers, spectrofluorometer, radiation equipment, liquid chromatographs, high speed refrigerated centrifuges and several gas chromatographs. Computer facilities include several Apples in the department. The university library includes more than 100 journal subscriptions in chemistry plus numerous texts and related books.

Career Opportunities

Because of the increasing technological nature of our society, chemistry graduates will find an impressive array of options and exciting opportunities in a wide range of fields. A chemistry degree can provide preparation for a career as a professional chemist in areas such as basic research, environmental protection, instrumentation, new product and process development, and education. There is an increasing need for technical expertise in expanding fields such as agricultural chemistry, biotechnology forensic science, clinical chemistry, food science, occupational safety and environmental monitoring. Careers for chemists in the academics include university teaching and science teaching in the secondary school — an area that will expand greatly in the future. In addition there is a need for technically trained people in nontraditional areas such as marketing and sales, scientific information, patent law, and health and safety. The baccalaureate degree can also provide a strong foundation for studies at medical, dental, veterinary and pharmacy schools. Students with chemistry degrees have been notably successful in these areas.

Faculty

David L. Zellmer, Chair

Sydney Bluestone
Dale C. Burtner
Kenneth W. Chan
Richard P. Ciula
David E. Clark
David L. Frank
Joseph R. Gandler
Helen J. Gigliotti
Barry H. Gump
George B. Kauffman
Donald K. Kunimitsu
Ronald L. Marhenke
Barbara J. Mayer
C. Dean Mitchell
Kin C. Ng
Howard K. Ono
Stephen A. Rodemeyer
Kenneth H. Russell
Jose Sy
Joe D. Toney
Allexander Vavoulis
Kin-Ping Wong
Stanley M. Ziegler

Undergraduate Programs

Chemistry Majors: The Bachelor of Arts degree with a major in chemistry consists of a total of 124 units including 36–39 units of chemistry. The Bachelor of Science degree with a major in chemistry consists of a total of 124 units including a minimum of 45 units in chemistry.

High School Preparation: The high school preparation for majors in the Department of Chemistry should include: algebra (2 years), plane and solid geometry, trigonometry; chemistry or physics.

Prospective students may elect to take the general chemistry placement test at college entrance. A satisfactory score in this test will permit the student to start the chemistry course sequence with Chem 1B.

Bachelor of Arts Degree Requirements

The Bachelor of Arts degree in Chemistry is intended primarily for those students who plan to take extensive coursework in other areas in addition to chemistry. This degree is suitable for pre-health professional students (premedical, predental, etc.), secondary school teaching credential students and biochemistry students oriented toward biotechnology and the health professions. This degree is *NOT* intended for students who anticipate a career in chemistry, or who expect to continue their education in pursuit of graduate degrees.

Note: Chemistry majors may not take courses listed in category A or B below for credit/no credit grades.

The Bachelor of Arts degree in Chemistry requires the student to complete the courses listed under either I. Biochemistry/Pre-Health Professional Emphasis, or II. Teaching Credential Emphasis.

I. Bachelor of Arts Degree — Emphasis: Biochemistry/Pre-Health Professional — *Units*

A. The B.A. Chemistry Major 27
Chem 1A–B, 102, 108, 128A–B, 129A

B. Additional requirements 31–38
Chem 155, 156 ..... (6)
Elect two courses from Chem 129B, 142, 153, 241A–B, 250T ..... (4–6)
Elect two courses from Biol 120 or 135, Biol 130, Micro 104 or other approved courses .. (5–8)
Math 75, 76 (Math 77 strongly recommended) .. (8)
Phys 2A–B (or Phys 5A–B strongly recommended) ..... (8–10)

C. Remaining General Education requirements 45*

D. Electives 14–21

Total 124

* Of the 51 required General Education units, 6 are satisfied by Phys 2A–B (or 5A–B) (Division 1) and Math 75 (CORE).

The following is an example of a program for the B.A. degree in Chemistry, Biochemistry/Pre-Health Professional Emphasis.

1st Semester — Fall	*Units*
Chem 1A	5
Math 75	4
Engl 1	3
Pl Si 2 or Hist 11 or 12	3
	15

2nd Semester — Spring	
Chem 1B	5
Math 76	4
Phys 2A or 5A	4–5
Hist 11 or 12, or Pl Si 2	3
	16–17

3rd Semester — Fall	
Chem 128A	3
Chem 129A	2
Phys 2B or 5B	4–5
Gen Ed	7
	16–17

4th Semester — Spring	
Chem 128B	3
Chem 102	5
Elect or Gen Ed	8
	16

5th Semester — Fall	
Chem 108	4
*Chem 155	3
Elect or Gen Ed	9
	16

6th Semester — Spring	
**Chem 156	3
Elect or Gen Ed	12
	15

7th Semester — Fall	
Elect or Gen Ed	15

8th Semester — Spring	
Elect or Gen Ed	15
Total	124

* Offered Fall semester only.
** Offered Spring semester only.

II. Bachelor of Arts Degree — Emphasis: Credential Program

The Single Subject Waiver Program for Physical Science leading to the B.A. degree in Chemistry enables one to teach chemistry, physics, and earth science at the secondary school level. The waiver program includes the following:

A. The B.A. Chemistry Major	Units
Chem 1A–B, 102, 108, 128A–B, 129A	27
B. Additional requirements	38
Chem 111, 139, 155	
Phys 2A–B (or Phys 5A–B strongly recommended), 102	
P Sci 168	
Math 75, 76 (Math 77 strongly recommended)	
C Sci 20 or 40	
Geol 1	
C. Remaining General Education requirements	45*
D. Electives (you may choose to satisfy some T Ed requirements here, see below)	14
Total	124

* Of the 51 required General Education units, 6 are satisfied by the B.A. core and additional requirements.

To receive the Clear Teaching Credential, the student must complete a 5th year program of 30 units beyond the baccalaureate degree. Normally, most credential candidates complete the Single Subject Waiver Program in Physical Science for the B.A. degree, and satisfy the Teacher Education (T Ed) requirements as their 5th year program. T Ed courses can be taken during baccalaureate studies, but only those taken during the *second semester of the senior year* can be used to satisfy the 5th-year 30-unit requirement for the Clear Teaching Credential (as long as those units are not being used to satisfy unit requirements for the B.A. degree).

The following is an example of a program leading to a B.A. degree in Chemistry and a teaching credential in Physical Science at the secondary level. This sample program emphasizes the need to take course sequences in mathematics and physics prior to Chem 108. In addition, it specifies certain semesters for some courses offered only once a year.

1st Semester — Fall	Units
Chem 1A	5
Math 75	4
Engl 1	3
Pl Si 2 or Hist 11 or 12	3
	15

2nd Semester — Spring	
Chem 1B	5
Math 76	4
Phys 2A or 5A	4–5
Hist 11 or 12, or Pl Si 2	3
	16–17

3rd Semester — Fall	
Chem 128A	3
Chem 129A	2
Phys 2B or 5B	4–5
Gen Ed	7
	16–17

4th Semester — Spring	
Chem 128B	3
Chem 102	5
**Phys 102	3
Elect or Gen Ed	5
	16

5th Semester — Fall	
Chem 108	4
*Chem 155	3
C Sci 20 or 40	4
Elect or Gen Ed	5
	16

6th Semester — Spring	
**Chem 139	3
Chem 111	3
Elect or Gen Ed	9
	15

7th Semester — Fall	
**P Sci 168	3
Elect or Gen Ed	12
	15

8th Semester — Spring	
Elect or Gen Ed	15
Total	124

* Offered Fall semester only.
** Offered Spring semester only.

Bachelor of Science Degree Requirements

The Bachelor of Science degree in Chemistry is intended for students who plan a career in chemistry. The B.S. degree is accredited by the American Chemical Society. Students who satisfactorily complete this program are recommended by the department for certification as graduate chemists by the American Chemical Society. The B.S. degree prepares the student to enter the job market or for graduate study leading to an advanced degree, such as a Master of Science or Doctor of Philosophy.

Note: Chemistry majors may not take courses listed in category A or B below for credit/no credit grades.

	Units
A. The B.S. Chemistry Major	46
Chem 1A–B, 102, 106, 110A–B, 111, 123, 124, 128A–B, 129A–B, 155	
B. Additional requirements	22
Math 75, 76, 77, Phys 5A–B	
C. Remaining General Education requirements	45*
D. Electives	11
Recommended: Chem 130, 140T, 142, 153, 154, 156, 160, 190	
Total	124

* Of the 51 required General Education units, 6 are satisfied by Phys 5A–B (Division 1) and Math 75 (CORE).

Transfer students are strongly urged to consult their adviser.

Many of the courses listed above have chemistry or other prerequisites. For that reasons, a sample program for the B.S. degree in Chemistry is outlined below. This sample program emphasizes the need to take course sequences in mathematics and physics prior to Chem 110A. In addition, it specifies certain semesters for some courses that are offered only once a year (Chem 123 and Chem 155 in the fall, Chem 124 in the spring). Finally, this program is constructed in such a way as to leave adequate time for independent study experience (Chem 190) in the senior year.

If a student wishes to deviate significantly from this sample program, particularly in regard to chemistry, physics and mathematics requirements, it is very important that an alternate program be developed in consultation with a departmental adviser. Any course substitutions or other changes to degree requirements can only be initiated by submitting a written request to the chair of the Chemistry Department.

An example of a program for the B.S. degree in Chemistry is outlined below:

1st Semester — Fall	*Units*
Chem 1A	5
Math 75	4
Engl 1	3
Hist 11 or 12, or Pl Si 2	3
	15

2nd Semester — Spring	
Chem 1B	5
Math 76	4
Phys 5A	5
Hist 11 or 12, or Pl Si 2	3
	17

3rd Semester — Fall	
Chem 128A	3
Chem 129A	2
Math 77	4
Phys 5B	5
Gen Ed	3
	17

4th Semester — Spring	
Chem 128B	3
Chem 129B	2
Chem 102	5
Gen Ed	6
	16

5th Semester — Fall	
Chem 110A	3
*Chem 155	3
*Chem 123	3
Chem or other elective	2
Gen Ed	4
	15

6th Semester — Spring	
Chem 110B	3
Chem 111	3
**Chem 124	2
Gen Ed	7
	15

7th Semester — Fall	
Chem 106	4
Chemistry or other elective	3
Chem 190 (recommended), or other elective	3
Gen Ed	4
	14

8th Semester — Spring	
Chem 190 (recommended), or other elective	3
Chemistry or other elective	3
Gen Ed	9
	15
Total	124

* Offered fall semester only.
** Offered spring semester only.

Chemistry Minor

A minor in chemistry for a bachelor's degree requires at least 21 units, of which at least 7 are upper division. Specific course requirements are General Chemistry (1A–B or 3A and 4), Organic Chemistry (8 and 109), Quantitative Analysis (105), and one or more upper-division chemistry courses, such as 125, 150, 151, 153, 154, 156.

Physical Science Minor

The physical science minor offers an opportunity for both non-science and science majors to diversify into important and interesting fields. It consists of 21 units of courses selected according to one of the patterns below:

	Units
A. Chem 3A–B or 1A–B	7
Phys 2A–B or 5A–B	8
Upper-division electives	6
	21

B. Chem 1	3
Phys 2A–B or 5A–B	8
Geol 1	4
Upper-division electives	6
	21

C. Chem 3A–B or 1A–B	7
Phys 10	4
Geol 1	4
Upper-division electives	6
	21

The upper-division electives may be any upper-division courses for which the student is qualified, from the three departments. Courses with very few prerequisites are Chem 139; Geol 105, 114, 151, 168, 169; Phys 145; P Sci 106, 168.

For chemistry, geology or physics majors, all courses must be outside the major department. The revised program must be approved by the chair of the major department.

Graduate Program

The Master of Science degree program in Chemistry is designed to provide the first graduate degree for students who expect to continue on to advanced graduate study in chemistry or biochemistry. It can also be used to extend the competence of students who anticipate employment in chemical industries, in government laboratories or as secondary school or junior college teachers.

Master of Science Degree Requirements

The Master of Science degree program in Chemistry assumes undergraduate preparation equivalent to a CSU, Fresno major in chemistry. Each new student is required to take the Diagnostic Placement Examinations in four fields of chemistry (physical, organic, analytical, and inorganic or biochemistry) to provide a basis for program planning. These are taken at the beginning of the first semester of residence.

Twenty-one of the 30 units required for the degree must be in chemistry. An option in agricultural chemistry is available in the School of Agricultural Sciences and Technology. For specific requirements, consult the departmental graduate adviser; for general requirements, see *Division of Graduate Studies and Research.*

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Project.*)

Under the direction of a graduate adviser, each student prepares and submits a coherent program individually designed according to Plan *A* or Plan *B* listed below. Other courses may be specified after examination of the student's record and performance on the departmental diagnostic examinations.

Plan A — M.S. degree with thesis *Units*

Courses in chemistry, including at least 21 units in 200 series (see *specific requirements*)	21
Approved electives in chemistry or related fields	9
Total	30

Specific requirements: Chem 201 (1 unit); 280 (at least 2 units); 295 (2 units); 299 (4 units); and 3 units each from 4 of the 5 following groupings: (i) 211 or 215; (ii) 220; (iii) 225, 226, or 227; (iv) 230 or 235; (v) 250T. Chem 260 recommended.

Other courses may be specified after examination of the student's record and his/her performance on the departmental diagnostic examinations.

Plan B — M.S. degree without thesis *Units*

Courses in chemistry, including at least 19 units in 200 series (see *specific requirements*)	19
Approved courses in chemistry or related fields may include biology, engineering, geology, mathematics, physics, etc) according to the student's objective.	11
Total	30

Specific requirements: Chem 201 (1 unit); 280 (at least 2 units); 295 (at least 4 units); and 3 units each from 4 of the 5 following groupings: (i) 211 or 215; (ii) 220; (iii) 225, 226, or 227; (iv) 230 or 235; (v) 250T.

Other courses may be specified after examination of the student's record and his or her performance on the departmental diagnostic examinations.

Instead of a thesis, a student must successfully complete a final comprehensive examination consisting of two parts: a) a general written examination in chemistry; b) an examination dealing with a specific area of chemistry. See department for *Policy Statement — Plan B Comprehensive Examination.*

Biotechnology Certificate Program

California State University, Fresno has initiated a Certificate of Advanced Study Program in Biotechnology. This intensive one-year postbaccalaureate program emphasizes Molecular Biology and a wide range of laboratory skills at the forefront of modern biotechnology. The biotechnology field is growing rapidly and, as new products and applications are commercialized, there is increased need for highly-skilled personnel capable of working in both research and production areas. Enrollment is limited to 12 to 15 students per year, who work closely with faculty in a variety of lecture and laboratory courses. Among the techniques studied are purification of biological macromolecules, gene splicing, DNA sequencing, culturing of mammalian cells, hybridoma production, and plant cell culturing and cloning.

The Certificate Program can lead to potential careers in expanding fields, such as drug and hormone production in the pharmaceutical industry, monoclonal antibody production for medical diagnostics, crop improvement, industrial bioprocessing and medical research. The program also provides a background for further postgraduate studies in fields such as Biochemistry, Molecular Biology and Agricultural Biotechnology. Some of the courses may also be used at CSUF as components of Master's Degree Programs in Biology, Chemistry, Plant Science and related departments.

Courses include: Molecular Biology (Biol/Chem 241A–B), Techniques in Protein Purification (Biol/Chem 242), Nucleic Acid Technology Lab (Biol/Chem 243), Cell Culture/Hybridoma Laboratory (Biol/Chem 244), Micropropagation (Plant Science 102), and Seminar in Molecular Biology/Biotechnology (Biol/Chem 248).

COURSES

Chemistry (Chem)

AR. Elementary Chemistry (2). For students without high school chemistry or those requiring a slower paced introduction to basic chemistry concepts. Emphasis on beginning concepts of chemistry and problem-solving skills. Dimensional analysis, atoms, atomic structure, bonding, formula writing, equation writing, moles, stoichiometry, chemical calculations, etc. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

1. Chemistry: Its Impact on Society (3). Not open to students with credit in college chemistry; for nonscience majors. Prerequisite: high school algebra or Math 1R. The significance of chemical principles in contemporary society; benefits and hazards relative to areas such as energy, health, diet, environment and agriculture. General Education BREADTH, Division 1. (2 lecture, 3 lab hours)*

1A–B. General Chemistry and Qualitative Analysis (5–5). Chem 1A not open to students with credit in Chem 3A or 1B. Students with credit in Chem 3A receive only 1 unit of credit. Prerequisite for 1A: high school chemistry or physics, two years of high school algebra or Math 4R; for Chem 1B: Chem 1A or Chem 4 with a grade of *C* or better. Fundamental principles of chemistry; properties of common elements and their compounds; application of the principles of chemical equilibrium to separation and identification of ions. General Education BREADTH, Division 1. (3 lecture, 6 lab hours)* (Chem 1A, CAN CHEM 2; Chem 1B, CAN CHEM 4)

* For safety reasons, "soft" contact lenses may not be worn in chemistry labs.

3A. Introductory General Chemistry (4). No credit for Chem 3A after 1A. Prerequisite: Math 4R. For non-science majors. Composition of matter and physical and chemical changes; fundamental laws and principles; atomic and molecular structure; acid-base theory, redox and equilibria; qualitative and quantitative theory and techniques. General Education BREADTH, Division 1. (3 lecture, 3 lab hours) (Former Chem 2A)

3B. Introductory Organic and Biochemistry (3). No credit for Chem 3B to students with credit in 1B. Primarily for students in health-oriented professions; not a substitute for Chem 8. Prerequisite: Chem 3A (Chem 2A not sufficient), Math 4R. Introduction to the basic concepts of organic and biochemistry. Structure and behavior of organic and biological compounds, metabolism and regulation. General Education BREADTH, Division 1. (2 lecture, 3 lab hours) (Former Chem 2C)

4. Introduction to Chemical Theory (2). One unit of credit after Chem 1A. Not recommended for the health-oriented professions. Prerequisite: Chem 3A or Chem 1A. Chem 3A and Chem 4 are equivalent to Chem 1A. Intermediate development of the concepts of chemistry; fundamental laws and principles of atomic and molecular structure, stoichiometry, ionic equilibria and energy relationships.

8. Elementary Organic Chemistry (3). Not open to chemistry majors. Recommended for students requiring a one-semester course in the field. Prerequisite: Chem 1A or 3A. Lectures, discussions and demonstrations of fundamental principles; structure and chemical behavior of organic compounds.

99. Glass Blowing (1). Enrollment limited with preference to junior and senior chemistry majors. Elements of glass blowing; construction and repair of glass apparatus. (3 lab hours)*

102. Analytical Chemistry (5). For chemistry majors; recommended for other science majors. Prerequisite: Chem 1B, 128A, and Math 76. Students with credit in a similar lower-division quantitative analysis course will receive only one additional unit of credit. Introduction to principles and methods of analytical chemistry. (3 lecture, 6 lab hours)*

105. Quantitative Analysis Laboratory (4). Not open to chemistry majors. Prerequisite: Chem 4 (Chem 1B recommended), Chem 8 (or concurrently). Laboratory study of principles and methods of quantitative analysis. (2 lecture, 6 lab hours)*

106. Analytical Measurements Laboratory (4). Prerequisite: Chem 110A and Phys 5A. Principles and methods of analytical measurements of organic and inorganic substances by instrumental and non-instrumental techniques. (2 lecture, 6 lab hours)*

108. Introductory Physical Chemistry (4). Prerequisite: Math 76 (Math 77 strongly recommended), Chem 8 or 128A and Physics 2A–B (Physics 5A–B strongly recommended). Basic treatment of gas laws, thermodynamics, phase equilibria, properties of solutions, kinetics and spectroscopy. Meets the physical chemistry requirement in the Chemistry B.A. degree.

* For safety reasons, "soft" contact lenses may not be worn in chemistry labs.



109. Elementary Organic Chemistry Laboratory (3). Not open to chemistry majors. Prerequisite or concurrently: Chem 8 or 128B. Laboratory study of the carbon compounds with coordinating lectures. (1 lecture, 6 lab hours)*

110A–B. Physical Chemistry (3-3). Prerequisite: Math 77, Chem 1B, 8 or 128A; Phys 5A–B (or permission of instructor). Mathematical treatment of the laws of thermodynamics, reaction kinetics, elementary statistical and quantum mechanics, properties of solutions, kinetic theory of gases, crystal structure, molecular structure, and nuclear chemistry.

111. Physical Chemistry Laboratory (3). Prerequisite: Chem 110B (or concurrently), Chem 102. May not be taken concurrently with 106. Techniques of physical measurements, error analysis and statistics; ultraviolet, infrared and nuclear magnetic resonance spectroscopy; dipole moments, viscosity, calorimetry, kinetics, phase diagrams, thermodynamic measurements, and report writing. (1 lecture, 6 lab hours)*

123. Advanced Inorganic Chemistry (3). Prerequisite: Chem 1B, 102 and 110A (or concurrently). Treatment of ionic and covalent bonding, atomic structure, molecular structure and reaction mechanisms. Introduction to visible and infrared spectroscopy of transition metal complexes, special topics.

124. Synthesis and Characterization (2). Prerequisite: Chem 123 (or concurrently). Techniques of preparation to include high temperature reactions, vacuum line and glove box preps, nonaqueous syntheses, solid state reactions. Emphasis on structural characterizations using instrumental methods. (6 lab hours)*

125. Laboratory Instrumentation (3). (Same as Phys 125.) Not open to Chemistry majors. Prerequisite: Chem 8 or 128A and Chem 105. Basic electricity/electronics, light and optical systems as they apply to the design, use and limitations of instrumentation typical to the analytical and bioscience laboratory. (1 lecture, 6 lab hours)*

127. Organic Problems (1). Prerequisite: Chem 8 or 128A; 128B concurrently. Designed to review organic chemistry, in particular for those students who have taken only a brief course in organic chemistry. *CR/NC* grading only; not applicable to the requirements of a major in chemistry.

128A–B. Organic Chemistry (3–3). For chemistry majors; recommended for premedical students and other science majors. Chem 128A not open for credit to students with credit in Chem 8. Prerequisite: Chem 1B or Chem 4 with a grade of *C* or better; for Chem 128B: Chem 128A with a grade of *C* or better. Introduction to structure and reactivity of principal classes of organic compounds with emphasis on theory and mechanism. (Former Chem 28, 128)

129A–B. Organic Chemistry Laboratory (2–2). Prerequisite or concurrently: Chem 128A (for 129A); 128B (for 129B). Laboratory study of the methods, techniques, syntheses and instrumentation or representative classes of organic compounds; introduction to research techniques by way of independent projects; introduction to qualitative organic analysis. (6 lab hours) (Former Chem 29, 129)

130. Organic Analysis (3). Prerequisite: Chem 102, 128B, 129B. Characterization of organic compounds through study of chemical and physical properties; application of spectroscopy, chromatography and functional group analysis to elucidation of structure. (1 lecture, 6 lab hours)*

139. Chemistry and the Consumer (3). Prerequisite: Chem 3B, 8 or 128A. The impact of chemistry on society and individual lives. Topics selected from: foods as chemicals, food additives, drugs and medication, petrochemistry and the source of chemicals, pesticides and agricultural chemicals, chemical ethics and current topics of interest.

140T. Topics in Chemistry (1–4; max total 6 if no area repeated). Prerequisite: permission of instructor. Seminar covering special topics in one of the areas of chemistry: analytical, biochemistry, inorganic, organic, physical. Some topics may have a laboratory.

142. Introduction to Biotechnology (3). Prerequisite: Chem 150 or permission of instructor. This course emphasizes the principles and industrial utilization of recombinant DNA, monoclonal antibodies, enzyme and cell immobilization, fermentation technology, and downstream processing.

150. General Biochemistry (3). Prerequisite: Chem 8. (Chem 150 and 153 together constitute a year sequence.) Chemistry and metabolism of basic cellular constituents including carbohydrates, lipids, proteins, and nucleic acids.

151. General Biochemistry Laboratory (2). Prerequisite: Chem 8, 105, 109, 150 (or concurrently). Chemical and physical properties of naturally occurring compounds; introduction to techniques of chromatography, polarimetry, electrophoresis, photometry, and enzymology. (6 lab hours)*

153. Physiological Chemistry and Metabolism (2). Prerequisite: Chem 150 or 155. Continuation of Chem 150 or 155. Intensive discussion of the degradation and biosynthesis of major cellular constituents; energy metabolism; control of metabolic processes and pathological implications in mammalian systems.

154. Clinical Biochemistry Laboratory (3). Prerequisite: Phys or Chem 125, (or concurrently), Chem 151, 153 (or concurrently). Clinical laboratory methods of analysis of tissues and body fluids and their diagnostic value; emphasis on instrumental methods. (1 lecture, 6 lab hours)*

155. Fundamentals of Biochemistry (3). Primarily for chemistry majors; recommended for premedical students and graduate students in the sciences. Prerequisite: Chem 102 or 105, 109 or 129A, 128B. (Chem 155 and 153 together constitute a year sequence.) Structure, function, and metabolism of chemical entities in living systems.

156. Biochemical Laboratory Techniques (3). Prerequisite: Chem 150 or 155 (or concurrently). This course is designed to introduce the student to a range of techniques and methodology appropriate to the study or phenomena at the biochemical, cellular and organismic levels. (1 lecture, 6 lab hours)*

160. Introduction to Research Techniques (3). Prerequisite: permission of instructor. Concepts in the design of experiments. Development of practical research skills through the planning and undertaking of a short laboratory project. (1 lecture, 6 lab hours)

180. Seminar in Chemistry (1). Prerequisite: Chem 129B, 102. Oral presentation of topics based on the chemical literature.

190. Independent Study (1–3; max see reference). Prerequisite: Chem 160 or permission of instructor. See *Academic Placement — Independent Study.* Approved for *SP* grading.

* For safety reasons, "soft" contact lenses may not be worn in chemistry labs.

GRADUATE COURSES

(See *Course Numbering System.*)

201. Chemistry Laboratory Teaching Techniques (1). Laboratory safety, lab lecture techniques, equipment setups, grading, etc. Primarily for teaching assistants in Chemistry.

207. Radiotracer Methodology in the Natural Sciences (3). (Same as Biol 207 and Phys 207. See Biol 207 for course description.) (2 lecture, 3 lab hours) (Former N Sci 207).

211. Chemical Thermodynamics (3). Prerequisite: Chem 110A–B, 111. Principles of thermodynamics; application to chemical problems; introduction to statistical methods, calculation of thermodynamic functions from spectroscopic data.

212. Chemical Applications of Group Theory (1–2). Prerequisite: Chem 110A–B. Introduction to symmetry operations, point groups and their properties. Application of group theory to chemical problems such as; selection rules for electronic, IR, Raman and microwave activity, molecular orbital theory, transition metal complexes, hybridization, and other chemical topics.

215. Quantum Chemistry (3). Prerequisite: graduate standing. Seminar on recent advances in quantum mechanics; chemical bonding, and atomic and molecular spectroscopy.

220. Theoretical Inorganic Chemistry (3). Prerequisite: Chem 110A–B. Seminar on theoretical inorganic chemistry emphasizing structure and bonding of inorganic and coordination compounds; valence bond, molecular orbital and ligand field theories; correlation of structure and reactivity.

225. Separation Methods in Chemistry (1–3). Prerequisite: Chem 106 and 129B. Seminar on the theory, application, and literature of various separation methods for organic and inorganic analysis. May include laboratory.

226. Electrochemistry (1–3). Prerequisite: Chem 106. Seminar on the theory, application, recent developments, and literature of electrochemistry and electrochemical methods of organic and inorganic analysis. May include laboratory.

227. Analytical Spectroscopy (1–3). Prerequisite: Chem 106, 110A–B or permission of instructor. Theory, instrumentation and application. Recent developments and literature of spectroscopic techniques. May include laboratory.

230. Advanced Organic Chemistry (3). Prerequisite: Chem 128B,129B. Seminar on recent advances in organic chemistry including reaction mechanisms and synthetic applications with references to current literature.

235. Physical Organic Chemistry (3). Prerequisite: Chem 110A–B, 128B. Seminar in applications of modern theoretical concepts to the chemical and physical properties of organic compounds.

240T. Topics in Advanced Chemistry (1–3). Seminar covering special topics in one of the areas of chemistry: analytical, biochemistry, inorganic, organic, physical. Some topics may have a laboratory.

241A–B. Molecular Biology I–II (3–3). (Same as Bio 241A–B.) Prerequisite: Biol 135, Chem 150 or 155, and permission of instructor. Seminar covering current topics in molecular biology. Topics include: protein and nucleic acid structure, DNA replication, transcription, translation, bacterial and animal viruses, prokaryotic and eukaryotic regulation, mechanisms of exchange of genetic material, and recombinant DNA technology. Biol/Chem 241A is prerequisite for Biol/Chem 241B.

242. Techniques in Protein Purification and Analysis (3). (Same as Biol 242.) Corequisite: Biol/Chem 241A. This course will deal with the technologies relevant to protein isolation, purification, analysis, immobilization, and modification in micro and macro quantities. (1 lecture, 6 lab hours)

243. Nucleic Acid Technology Lab (3). (Same as Biol 243.) Prerequisite: Biol/Chem 241A and 242. Corequisite: Biol/Chem 241B. A lecture/laboratory course focusing on the technologies used in nucleic acid chemistry, specifically synthesis, translation, mutagenesis, and genetic engineering. (1 lecture, 6 lab hours)

244. Cell Culture and Hybridoma (2). (Same as Biol 244.) Prerequisite: Micro 117 or 185. The theory and practice of in vitro propagation of eukaryotic cells, including growth characteristics, metabolic requirements and genetic analysis. Cloning, fusion and generation of monoclonal antibody (hybridoma) are presented relative to cultured cell biology and application to biotechnology. (1 lecture, 3 lab hours)

248. Seminar in Molecular Biology and Biotechnology (1–2, max 4). (Same as Biol 248.) Prerequisite: admission into the Biotechnology Certificate Program. Reviews and reports on current literature in various aspects of biotechnology and molecular biology.

250T. Topics in Advanced Biochemistry (1–4). Prerequisite: Chem 150 or 155. Seminar covering special advanced topics in biochemistry such as the structure and function of enzymes, metabolic regulation, nucleic acid, biochemistry and analytical biochemistry.

260. Advanced Research Techniques (3). Prerequisite: classified standing, permission of instructor. Advanced concepts in the design of experiments. Development of practical research skills through the planning and undertaking of a short laboratory project. (1 lecture, 6 lab hours)

280. Seminar in Chemistry (1; max total 3). Approved for *SP* grading.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

295. Research (2). Prerequisite: permission of instructor. Independent investigations of an advanced character for the graduate student with adequate preparation. Approved for *SP* grading. (May include conferences, laboratory, library.)

299. Thesis (4). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

Chicano and Latin American Studies

School of Social Sciences
Chicano and Latin American Studies Program
Bill Flores, Coordinator
Social Science Building, Room 211
(209) 278-2848

Minor in Chicano/Latino Studies
Minor in Latin American Studies



Chicano and Latin American Studies (CLS) is an interdisciplinary program that has been successful in presenting a highly informed, active and challenging view of the Chicano/Latino experience in the United States and in U.S./Latin American relations. Chicano and Latin American Studies provides an opportunity for a pluralistic exchange of ideas in an interdisciplinary academic setting, where faculty, students and visiting Chicano and Latin American scholars can share experiences and create a dynamic, intellectual environment.

The Chicano and Latin American Studies Program is designed to meet the following objectives:

1. To promote an awareness of the historical and cultural roots of Chicanos/Latinos in the United States.
2. To enhance an understanding of Latin America.
3. To cultivate an appreciation of ethnic and national differences among all people.
4. To critically analyze the Chicano and the Latin American experience in terms of significant issues, theories, current problems, and solutions.
5. To provide students with a set of important professional skills to be utilized as they interact creatively and constructively with Chicano/Latino communities.

The program emphasizes an interdisciplinary approach to the study of family life, history, politics, culture, and the arts of Chicano and Latin American communities. The courses reflect an integrated approach in providing students with a greater knowledge and understanding of the essence and diversity of Chicanos and Latin Americans.

Faculty and Facilities

The Chicano and Latin American Studies Program consists of faculty whose teaching and research expertise cover a broad spectrum, including anthropology, education, history, sociology, political science and the arts. The program administers a Chicano Research Center that is engaged in research and community development and serves as a training center for students. The offices of the program also serve as a resource center for many of the Chicano/Latino student organizations and as an information center for the community.

Career Opportunities

Chicanos and other Latinos are the largest ethnic group in California. Demographers estimate that in California 40 percent of the population will be of Mexican or Latino ancestry by the year 2030. This segment of our population will have a major impact on our society, as its presence translates into an increasing economic and political influence. Crucial social, economic and political decisions will be made that affect this group and the nation at large. The growth of Latino-owned businesses, Spanish language media networks and political organizations are all indicators of the importance of the Spanish-speaking people in the U.S. economy.

Business corporations and government agencies are looking for individuals who have a basic awareness of the Chicano/Latino population. Educators, lawyers, civil service employees and other professionals in various careers will enhance their marketability by having a basic knowledge of this population.

Students of non-Mexican origin find that Chicano and Latin American Studies courses are personally rewarding because they enable them to understand and relate to persons of different social and cultural backgrounds. Chicano and other Latino students find these courses highly conducive to strengthening their sense of identity and pride in their heritage.

For more information regarding career options in Chicano and Latin American Studies, contact the program coordinator at (209) 278-2848. For academic advising and assistance, students are encouraged to visit the CLS office located in Social Sciences Building, Room 211.

Faculty

Bill Flores, *Coordinator*

Manuel Figueroa
Hisauro Garza
Jesus Luna
Ernesto A. Martinez
Lea Ybarra

Minors

The Chicano and Latin American Studies Program offers two minors — one in Chicano/Latino Studies and one in Latin American Studies. Students intending to pursue a minor in either area must see a CLS adviser who will assist students in planning their course of study.

Chicano/Latino Studies Minor

	Units
Lower division: CLS 3, 5 and 7 or 9	9
CLS upper-division electives	12
	21

Latin American Studies Minor

	Units
Lower division: CLS 3, 70, 72	9
Approved upper-division courses	12
	21

Credential Program for Liberal Studies Students

CLS requirements for liberal studies students who wish to complete a credential program are listed below:

Bilingual/Cross-Cultural Emphasis in Liberal Studies. Students wishing to prepare to teach in bilingual/cross-cultural education settings should include the following courses in their Liberal Studies Major Program: CLS 3, 5, 116, 143, and 145.*

I think the interaction between the minority and majority students is crucial to the success of Chicano and Latin American classes. I try to teach them that you have to respect differences and not allow them to become a source of division.

Lea Ybarra
Professor, Chicano and Latin American Studies

COURSES

Chicano and Latin American Studies (CLS)

3. Introduction to Chicano/Latino Studies (3). Introduction to the historical and contemporary experiences of Chicanos and other Latinos in American society. Their contributions to the U.S. and their current economic, political and social status are discussed. General Education BREADTH, Division 9.

5. Chicano Culture (3). A historical examination of Chicano culture from the pre-Columbian period to the present. The customs, values, belief-systems and their symbols are analyzed; important events and changes occurring through time are emphasized. General Education BREADTH, Division 9.

7. Music of Mexico and the Southwest (3). A study of Mexico's musical culture starting from its pre-Columbian origins to the present and its impact on contemporary Chicano music. General Education BREADTH, Division 5.

9. Chicano Artistic Expression (3). Introduction to Chicano artistic expression, with special attention to cultural continuity and change; the interrelationships between popular music, dance, drama, literature and the graphic arts are analyzed. General Education BREADTH, Division 5.

20. Freshman Seminar for Minority Students (3). Open to freshmen and transfer students. Designed to further student development in such areas as study skills, writing, oral presentations, and interaction with other students and faculty. Students are assigned a faculty mentor. (Former CLS 180T section)

70. Introduction to Latin American Studies (3). A basic overview of Latin America; its nations, history, problems and realities. Theoretical paradigms utilized to analyze Latin American issues are discussed.

72. Latin American Creative Expression (3). Provides students with an understanding of the cultural history and contributions of Latin American nations. The art and writings of individuals such as Diego Rivera, Pablo Neruda, Gabriel Garcia Marquez and Isabel Allende are explored.

100. Chicano Literature (3). An interpretive analysis of written Chicano literature: poetry, drama, short story, novel and essay. The relationship between literature and a changing Chicano sociocultural environment is explored. (Former CLS 111)

101. Chicano Art (3; max total 6). Chicano Studio Arts, including various media such as oil, ceramics, weaving, sand painting and murals that relate to the heritage of the Chicano. Special emphasis on individual development of artistic and technical expression.

103. Chicano Folklore (3). An analysis of Chicano folklore and its relationship to earlier Indo-Hispanic antecedents. Emphasis is placed on the folk arts: verbal, material and musical, as well as folk beliefs and practices, as these have been modified by intercultural contact. General Education CAPSTONE Cluster, Critical Thinking.

106. Folkloric Dance (3; repeatable up to 12 units). History and performance of Mexican folk music and dance; Indian, African, Spanish and European influences; contemporary relationships to Chicano culture. (Former CLS 106A–B)

107. Latino Dance (2; max total 4). Examination of origins, composition, and performance of various types of Chicano/Latino music and dance: boleros, huapangos, cumbias, chachas, salsa; emphasis on contemporary and cross-cultural influences in Chicano/Latino music-and-dance. *CR/NC* grading only.

108. Chicano Theatre (1–3; repeatable up to 12 units). Production of Chicano Theatre for major performances. *Comedia del Arte,* Passion Plays, Theatre of the Absurd, Socially Popular Theatre: *Teatro Compesino.*

* The above upper-division courses have prerequisites which must be taken: CLS 5 for CLS 116, CLS 3 for CLS 145, CLS 116 for CLS 143.

112. Pre-Hispanic Civilizations (3). Historical examination of the origins of the Maya-Aztec civilizations in Meso America until 1521. The values, social organization, religion and their daily lives, technological and scientific achievements will be examined.

114. Mexico and the Southwest 1810–1910 (3). Nineteenth Century origins of Mexican Nationality from the period of Mexico's Independence from Spain to the Mexican Revolution of 1910. The experiences of La Raza in the U.S. after the Treaty of Guadalupe Hidalgo. General Education CAPSTONE Cluster.

115. Mexico-U.S. Relations Since 1910 (3). Historical perspective of changing relationship between Mexico and the U.S. during 20th Century. Analysis of Mexican Revolution, the Great Depression, WWII, immigration, and their impact on Mexico-U.S. relations. Special emphasis on status of Mexicanos/Chicanos in the U.S. General Education CAPSTONE Cluster.

116. Cultural Change and the Chicano (3). Prerequisite: CLS 5; for Bilingual/Cross-Cultural Emphasis students only. An analysis of the continuities and the changes in the culture and daily life of the urban and rural Chicano in the 20th Century created by immigration, acculturation, urbanization, and technological and scientific changes. General Education CAPSTONE Cluster.

123. Business Development in Minority Communities (3). Business and economic development in minority communities and their relationship to the wider economic and social systems.

126. Chicanos in the U.S. Economy (3). Historical analysis of the Mexicano's relationship to American economy. The transformation of the Chicano/Mexicano from rural, agricultural laborer to urban, industrial worker; special emphasis on immigration, the development of dual labor markets, and their effects on Chicanos. (Former CLS 119)

128. Contemporary Political Issues (3). Political philosophies, goals, and strategies of Chicanos and Latinos as reflected in their attempts to gain political power.

141. The Chicano and the Educational System (3). Exploration of the socio-historical development of public education in the southwest, with special emphasis on the Chicano experience. Topics include segregation/desegregation, institutional racism, and equality of opportunity. (Former CLS 136)

142. Chicano Research: Issues and Analysis (3). An interdisciplinary approach to research techniques with special emphasis upon issues, problems, and research designs appropriate to the study of Chicano communities. Filed application of research plans, techniques including methods of observation, gathering, and analyzing data. (Former CLS 138)

143. Bilingual/Bicultural Education (3). Prerequisite: CLS 116; for Bilingual/Cross Cultural Emphasis students only. Investigation into what it means to be bilingual and bicultural; review of programs scaled toward a more meaningful education for the Chicano child. (Bilingual Education majors see Coordinator for further prerequisites) (Former CLS 137)

145. Field Work in Community Settings (3; max total 6). Prerequisite: CLS 3; for Bilingual/Cross Cultural Emphasis students only. Supervised placement in community and educational settings. Provides a variety of learning experiences in community agencies, organizations or educational institutions. (Bilingual Education majors, see coordinator) (Former CLS 139)

152. The Chicano Family (3). (Same as W S 152.) Traditional and changing relationships in the family structure of the Chicano; interaction with wider institutional social system. General Education CAPSTONE Cluster. (Former CLS 129)

154. The Chicano Child (3). General psychological principles and theories of growth and development and their applicability to the Chicano child. (Former CLS 131)

156. The Chicano Adolescent (3). The adjustment of Chicano adolescents to American society and its impact on self, peer group relations, and family life; with emphasis on sources of conflict and tension. (Former CLS 134)

158. Health and Social Services in the Chicano Community (3). An analysis of health and social service programs, their policies and effects on the Chicano community. Explores alternatives to dependent social services programs. (Former CLS 135)

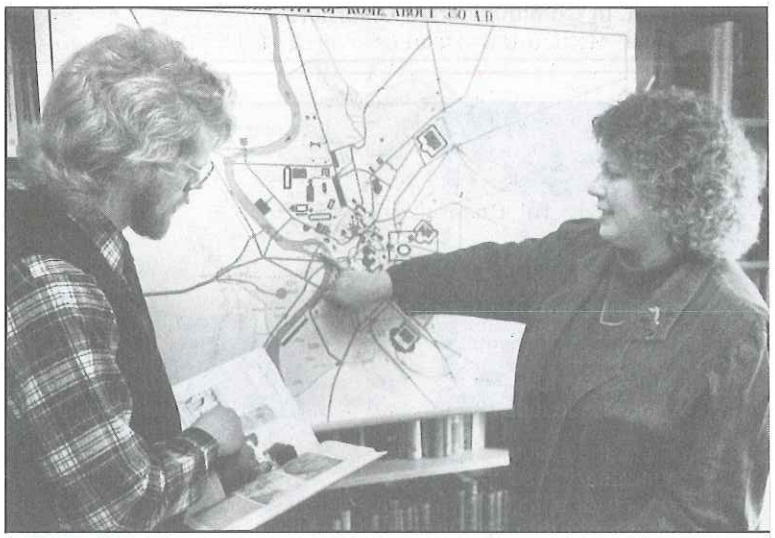
160. Sex, Race and Class in American Society (3). Focuses on ethnic identity and gender and their interrelationship with socio-economic class structure in American society. Sexism, racism and class inequities, particularly as they impact Chicanos and other minorities, are analyzed. General Education BREADTH, Division 9. (Former CLS 1)

180T. Topics of Chicano Society (1–3; repeatable with different topics). Culture, art forms, economy, and societal organization. Certain CLS 180T classes are on a *CR/NC* grading only. See department for further information. (Former CLS 150T)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

Classical Studies Interdisciplinary Minor

School of Arts and Humanities
Department of Foreign Languages
Pamela L. Vaughn, Coordinator
San Ramon 4, Room 131
(209) 278-3056



Although the university does not offer a bachelor's degree program in classical studies, the School of Arts and Humanities has coordinated a variety of courses in several disciplines that allow comprehensive study of the Greek and Roman world. For students interested in classical studies, two alternatives are available.

First, a student may petition for a special major based on the program approved by the campus-wide Committee on Classical Studies, available from the coordinator of classical studies. Students are strongly urged to read carefully the policy for the special major for the Bachelor of Arts degree. (See *Degree Requirements — Special Major for the Bachelor of Arts Degree.*) Second, the university offers a classical studies minor with three areas of interest.

Minor

The classical studies minor is designed for students who are interested in classical civilization and for those who wish to have a chance to teach classical languages and culture or who wish to enter a graduate school where such a minor would give a sound foundation for further work in any of the areas mentioned above.

The minor allows for three areas of interest: Latin, Greek, and Classics (Greek and Latin).

Latin

Required Courses:	*Units*
History 112 or IntD 108	3
Latin 1A–B	6
Latin 131T (2)	6
Electives	9
Total	24

Greek

Required Courses:	*Units*
History 111 or IntD 108	3
Greek 1A–B	6
Greek 131T (2)	6
Electives	9
Total	24

Classics

Required Courses:	*Units*
History 111, 112	6
Latin 1A–B	6
Greek 1A–B	6
Latin 131T or Greek 131T	3
Electives	3
Total	24

Course Electives

The following list includes the courses most directly concerned. For further information, consult the classical studies coordinator, Dr. Pamela L. Vaughn, Department of Foreign Languages, San Ramon 4, Room 143.

Art History	10	The Ancient and Primitive World (3)
	109T	Topics in Art History (1–3; max 3 per area)
Drama	185	History of the Theatre and Drama (3)
Humanities	IntD 108	Humanities of the Ancient World (3)
English	112	World Literature: Ancient (4)
	169T	Forms of Literature: Mythology (4)
	191T	Supervised Independent Readings (1–4): Ancient Literature
Foreign Language:		
Greek	1A–B	Elementary Greek (3–3)
	10	Fifth Century Athens (3)
	131T	Greek Literature (3; max total 9 if no topic repeated)
	148	Greek Literature in English Translation (3)
	190	Independent Study (1–3)
Latin	1A–B	Elementary Latin (3–3)
	131T	Latin Literature (3; max total 9 if no topic repeated)
	132	Classical Mythology (3)
	148	Roman Literature in English Translation (3)
	190	Independent Study (1–3)
History	1	Western Civilization I (3)
	103A	History of Early Christianity (3)
	110	Ancient Near East (3)
	111	Ancient Greece (3)
	112	Ancient Rome (3)
	116	Greek and Roman Religion (3)
	119T	Studies in Ancient History (1–3; max total 6 if no topic repeated)
	190	Independent Study (1–3)
Philosophy	101	Ancient Philosophy (3)
	108	Roman Philosophy (3)
Physical Science	106	History and Philosophy of Physical Science (3)
Physical Education	111	The Olympic Games (3)
Political Science	110	Seminar in History of Political Thought to Macchiavelli (3)

Communicative Disorders

School of Health and Social Work
Department of Communicative Disorders
Kenneth G. Shipley, Chair
Laboratory School, Room 125
(209) 278-2423
(209) 278-2423 TTD

B.A. in Communicative Disorders
Minor in Communicative Disorders
M.A. in Communicative Disorders



Audiology, education of the deaf and speech-language pathology are concerned with the development, problems and disorders found with people's speech, hearing and language. These professions are devoted to providing diagnostic, rehabilitative and educational services to children and adults with communicative problems.

Bachelor of Arts

The Bachelor of Arts degree in Communicative Disorders provides the student with a liberal arts foundation integrated with courses designed to provide a basic understanding of speech, language, and hearing development and communicative problems. This degree also leads to graduate specialization in audiology, education of the deaf or speech-language pathology.

Master of Arts

Education beyond the bachelor's degree is necessary for completion of the academic, credential and licensure requirements leading to professional employment. Three professional option areas are available to the student:

Audiology. Our audiology program provides you with a balanced program of study including basic speech and hearing science, diagnostic testing procedures, aural rehabilitation, and the clinical treatment of hard-of-hearing individuals. The program is nationally accredited by the Educational Standards Board (ESB) of the American Speech-Language-Hearing Association.

Education of the Deaf. Our education of the deaf program gives you a broad background in speech, language, auditory training, sign language and psychology of the deaf. We present a "total communication" approach that includes all of the essential elements of a good education for the deaf child. The program is nationally accredited by the Council on Education of the Deaf (CED).

Speech-Language Pathology. Our speech and language pathology program provides you with a broad professional background in normal speech and language development, language disorders, voice disorders, articulation disorders and fluency disorders. The program is nationally accredited by the Educational Standards Board (ESB) of the American Speech-Language-Hearing Association.

The undergraduate curriculum plus a master's degree in communicative disorders prepares you for one or more of the following: state licensure as a speech-language pathologist or audiologist, national certification in speech-language pathology or audiology by the American Speech-Language-Hearing Association, provisional certification in education of the deaf by the Council on Education of the Deaf, public school special education specialist or clinical rehabilitation credentials, and/or school multiple subjects credentials.

Minor

A minor in communicative disorders is also available for students in various education and health professions (nursing, health science, physical therapy, counseling, elementary and secondary education, special education, child development, linguistics, criminology, etc.) who are interested in expanding their understanding of children and adults with communicative disorders.

Facilities

As a student at CSU, Fresno you are given the opportunity to work in a well-equipped speech and hearing clinic. You can also gain practical experience in a variety of school, private practice and hospital situations. Library facilities contain specialized collections including student access to local medical libraries. In the Anna Michelson Memorial Instructional Media Center, students have access to a wide range of therapy production materials such as films, video, clinical equipment and professional journals.

Language, Speech and Hearing Clinic. The Department of Communicative Disorders operates an ongoing clinic that provides diagnostic, therapeutic and counseling services to clients of all ages with a variety of different communication problems or disorders.

The clinic provides supervised clinical practice for students who are preparing to be professional speech-language pathologists, audiologists and educators of the deaf. Functioning as a valuable community resource, the clinic serves thousands of clients each year from the Fresno metropolitan area. The clinic is accredited by the Professional Services Board (PSB) of the American Speech-Language-Hearing Association.

Career Opportunities

The Department of Communicative Disorders prepares you to work in various diagnostic and rehabilitation settings in preschool programs, elementary and secondary schools, colleges, hospitals, rehabilitation centers, private or community clinics, or private practice. Employment opportunities have been and are expected to remain very good.

Faculty

Kenneth G. Shipley, *Chair*

Bette J. Baldis
M. N. Hegde
Karen M. Jensen
Ben R. Kelly
Paul W. Ogden
Ron M. Parker
Susan J. Shanks
Steven D. Wadsworth

Graduate Coordinator: Bette J. Baldis
Audiology Advisers: Ben R. Kelly, Ron M. Parker
Education of the Deaf Advisers: Bette J. Baldis, Karen M. Jensen, Paul W. Ogden
Speech-Language Pathology Advisers: M. N. Hedge, Susan J. Shanks, Kenneth G. Shipley, Steven D. Wadsworth
Clinic Director: Deborah J. Davis

Bachelor of Arts Degree Requirements
Communicative Disorders Major

	Units
1. Major requirements (see Note 1)	48
a. *Core:* C D 80, 90, 95, 102, 103, 114, 116, 128, 131, 133	(28)
b. *Concentration:* (select one)	(15–20)
Speech and Language Pathology: C D 105, 107, 109, 110, 112, 115	(16)
Audiology: C D 105, 107, 108, 109, 110, 137	(15)
Education of the Deaf: C D 106, 108, 135, 137, 162, 163, 164	(20)
c. *Approved electives*	(0–5)
2. General Education requirements:	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be courses used to satisfy credential requirements or a minor in another field.	25
Total	124

Notes:

1. Contact the communicative disorders department chair or faculty advisers for a list of approved elective courses.
2. *CR/NC* grading is not permitted for majors in the communicative disorders department.
3. General Education and elective units may be used toward a dual major or minor (see *Dual Major* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.

Communicative Disorders Minor

A minor in communicative disorders is designed to provide students in psychology, education and the health professions with an appreciation and understanding of the problems and procedures related to people who suffer from speech, language and hearing disorders.

	Units
C D 80, 90, 95, 102, 114, 128, 131, 133	22
	22

Graduate Program

The master's degree is considered essential for the professional training needed for effective clinical practice in audiology, education of the deaf, or speech-language pathology. The degree also provides the first graduate degree for students who may pursue advanced training toward a doctoral degree. The master's degree generally involves about two years of full-time study.

Admission Requirements. Admission as a classified graduate student in communicative disorders requires:

- A baccalaureate degree.
- An undergraduate major (or its equivalent) in communicative disorders.
- A 3.0 grade point average for the last 60 units of coursework taken.
- Graduate Record Examination (GRE), completing the Verbal and Quantitative Sections.
- Three letters of recommendation.

Students with a bachelor's degree in a field other than communicative disorders need to complete the undergraduate requirements of the major before beginning their graduate study. These students are eligible for unclassified graduate status at the university while completing their prerequisite coursework.

Applicants who have specific deficiencies or need coursework may be accepted with conditionally classified status. Students must apply to the department for fully classified graduate standing as soon as any conditions of acceptance have been met. No more than 10 units of graduate work taken under conditional classification can be used to meet the requirements of the master's degree.

Admission Procedures. Applications for the graduate program in communicative disorders are accepted until November 1 for the spring semester and March 1 for the fall semester. Applications received after these dates are considered the following semester. Application is a two-step process that involves submitting the following:

1. *To the University*
   - An Application of Admission and the Supplemental Application for Graduate Admission (forms *A* and *B* in the CSU application booklet).
   - Official transcripts from all universities and colleges other than CSU, Fresno.
   - Official GRE scores.
2. *To the Department*
   - Departmental application.
   - Official transcripts from all universities attended. (CSU, Fresno students may supply the unofficial transcripts issued by Admissions and Records.)
   - Official GRE scores. (Educational Testing Services lists the departments of Audiology and Speech Pathology. Your scores are forwarded to us automatically if you indicate either of these options.)
   - Three letters of recommendation. These letters should be written by instructors or other persons familiar with communicative disorders.

The departmental application and letter of recommendation forms are available from the department. Please be aware that students cannot be accepted into the graduate program until all materials are received by the university and the department. Students are encouraged to take their GRE *early* during their senior year to avoid delays in acceptance for graduate work.

Advancement to Candidacy. Each student in a master's degree program must file for advancement to candidacy. See *Admissions and Master's Degree Programs, Division of Graduate Studies and Research.*

Graduate-Level Writing Competence. CSU, Fresno requires that students have graduate-level writing abilities before being advanced to candidacy for the master's degree. Students can demonstrate these abilities by taking C D 200 and obtaining written clearance from the instructor. Written clearance can be obtained from the department for students who have demonstrated graduate-level writing abilities in coursework equivalent to C D 200.

Program of Study

Audiology

	Units
Common Core Courses: C D 200, 202, 231	9
Specialization: C D 232, 233, 234, 235, 240	15
Thesis or project; or non-thesis alternative	6
Total	30

Education of the Deaf

Common Core Courses: C D 200, 202, 231	9
Specialization: C D 232, 262, 263, 264	12
Approved electives	3
Thesis or project; or non-thesis alternative	6
Total	30

Speech-Language Pathology

Common Core Courses: C D 200, 202, 231	9
Specialization: C D 204, 206, 207, 210, 214	15
Thesis or project; or non-thesis alternative	6
Total	30

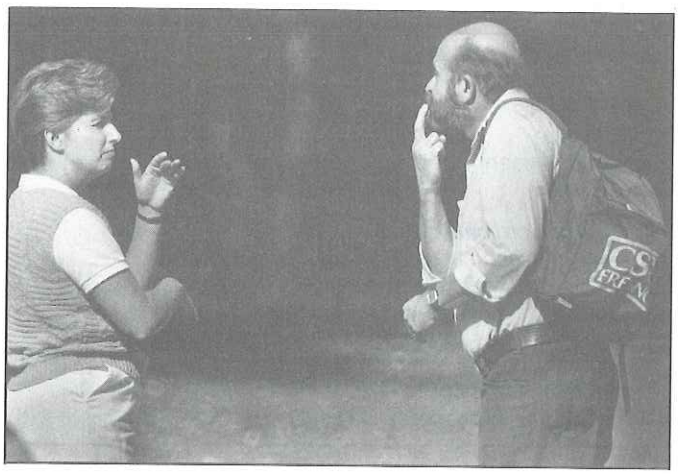
Other coursework is developed with the adviser to reflect such factors as students' desires regarding thesis or project, individual needs and desires for training, meeting certain state or national requirements, etc.

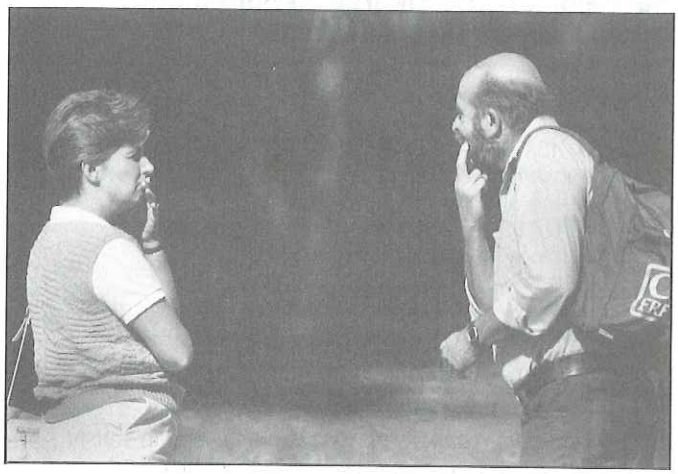
Thesis, Project, and Non-Thesis or Project Alternatives. The department offers students an opportunity to write a thesis or project. (See *Criteria for Thesis and Project.*) Six units of credit are earned for a thesis or project. These units may be applied toward the unit requirements of the degree. An adviser's permission is required before enrolling in a thesis or project. Selecting a thesis or project option is highly recommended for students who may at some point consider working toward a doctoral degree.

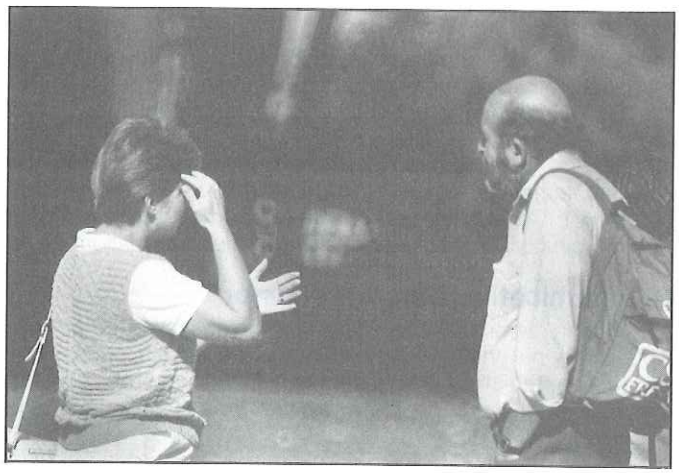
Clinical Training. All students are involved in supervised clinical practicum experience during their graduate training. At least 400 clinical hours are required prior to receiving the M.A. degree. A minimum of 150 of these hours must be at the graduate level. These hours are gained at the CSU, Fresno clinic and in at least one other setting (internship, student teaching, residency program, etc.).

Culminating Experience. A culminating experience is required of all CSU, Fresno master's degrees. Students in communicative disorders are involved with written examinations and an oral culminating experience.

Students choosing a non-thesis or project alternative take a written examination on six areas of the field, then take an oral examination on their written examination and subject matter within the field. For thesis and project students, their thesis or







A deaf student is seen on campus communicating with his interpreter using American Sign Language. The Department of Communicative Disorders offers several sign language courses.

project is considered as the written examination. These students are orally examined on the subject matter of their work and within the field. Additional information about these options is available from an adviser.

Certificate of Clinical Competence in Speech-Language Pathology and Audiology. Completion of the master's degree fulfills all the academic and clinical practicum requirements for the Certificate of Clinical Competence (CCC) in Speech Pathology or Audiology. A Clinical Fellowship Year (CFY) of paid, professional supervised experience is required along with passing the National Examination in Speech Pathology or Audiology (NESPA) before the certificate is granted by the American Speech-Language-Hearing Association. A Certificate of Clinical Competence is required for employment in nearly all work settings except the public schools. All students are encouraged to acquire national certification regardless of the work setting they may choose.

California License as a Speech Pathologist or Audiologist. The master's degree fulfills all academic and clinical practicum requirements for the State License. A year of Required Professional Experience (RPE) is necessary along with passing the NESPA before the license is issued by the Board of Medical Quality Assurance. The license is required for employment in almost all settings except the public schools.

The CFY and RPE can be completed concurrently when graduates accept their first professional position.

Certification by Council on Education of the Deaf. For students specializing in Education of the Deaf, completion of the master's degree fulfills all the academic and clinical practicum requirements for Provisional Certification by the Council on Education of the Deaf, the national organization responsible for certifying teachers of the deaf. Professional level certification is available following three years of successful teaching under the supervision of a professionally certified educator of hearing-impaired children. All students are encouraged to acquire national certification.

Credentials

There are two major school credentials available through the Department of Communicative Disorders; one of which has two option areas and the other has three option areas. By completing one (or more) of the credential options, students are eligible to receive the credential(s) they desire upon completion of the master's degree. Information regarding these credentials and options is available from departmental credential advisers.

Also, see *Admissions — Undergraduate Application Procedures* and *Education — Teacher Education — Admission to the Credential Program.*

Special Education Specialist: Communication Handicapped Credentials

Deaf and Severely Hard of Hearing Option	Units
Core courses: C D 80, 90, 95, 102, 103, 106, 128 and 131 (concurrently), 133, 135	28
Ed Deaf core: C D 108, 137, 162, 163, 164, 200, 202, 231, 232, 262, 263, 264	35
Clinical core: C D 160 or 260; C D 164B (4–9 units); C D 268 (6 units)	12–17
Generic core: C D 114, 116; T Ed 130, 140, 156M, 160B (5 units)*	20
Education core: T Ed 150, 160A (5 units)*	10
	105–110

The quality attention given by the excellent faculty did more than just provide an education. My teachers also encouraged me to participate in varied activities outside the classroom, making me a more well-rounded person.

Wong, Meng Soon
Alumnus from Singapore
Administrative Manager

Speech and Hearing Option	Units
Core courses: C D 80, 90, 95, 102, 103, 128 and 131 (concurrently), 133	22
Speech and Hearing core: C D 105, 107 and 110 (concurrently), 109, 112, 115, 200, 202, 204, 206, 207, 210, 213, 214, 231	43
Clinical core: C D 164A (4–9 units), 209 (1 unit), 230 (6–9 units) 250 (2 units)	13–21
Generic core: C D 114, 116; T Ed 130, 140, 156M, 160B (6 units)*	21
Education core: T Ed 150, 160A*	10
	109–117

Clinical Rehabilitative Services Credentials Audiology Option	Units
Generic Courses: C D 80, 90, 95, 102, 103, 105; 107 and 110 (concurrently), 108 and 137 (concurrently), 109, 114, 116; 128 and 131 (concurrently), 133; Psych 101, 136	48
Advanced Specialization in Audiology: C D 162, 163, 200, 202, 231, 233, 234, 235, 240	27
Clinical Core: C D 164C (4–9 units) or 269 (6 units), C D 130 or 230 (3 units), 150 or 250 (6–9 units)	13–21
	88–96

Language, Speech and Hearing Services Option	Units
Generic Courses: C D 80, 90, 95, 102, 103, 105, 107, 109, 110, 112, 114, 115, 116, 128 and 131 (concurrently), and 133; Psych 101, 136	50
Advanced Specialization in Language, Speech, and Hearing: C D 200, 202, 204, 206, 207, 210, 213, 214, 231	27
Clinical Core: C D 164A (4–9 units), 209 (1 unit), 130 or 230 (6–9 units), 150 or 250 (2 units)	13–21
	90–98

Language, Speech and Hearing Services with Severe Oral Language Handicapped Authorization Option	Units
Generic Courses: C D 80, 90, 95, 102, 103, 105; 107 and 110 (concurrently), 109, 112, 114, 115, 116; 128 and 131 (concurrently), and 133; Psych 101, 136	50
Advanced Specialization in Language, Speech and Hearing: C D 200, 202, 204, 206, 207, 210, 213, 214, 231	27
Advanced Specialization in Severe Oral Language Handicapped: C D 232, 264, T Ed 121, 120LA, 150, 156M, P E 146	19–21
Clinical Core: C D 164A (4–9 units), 209, 130 or 230 (6–9 units), 250 (2–3 units)	13–22
	109–120

* See requirements for the Student Teaching Multiple Subjects Credential — Education — Teacher Education.

COURSES

Note: Students must provide their own transportation in those courses requiring off-campus clinical instruction or observation and defray any resulting personal expense. Students involved with clinical practice must carry professional liability insurance and meet departmental health requirements.

Communicative Disorders (C D)

80. Introduction to Human Communication and Disorders (3). The bases of normal communication; assessment and remediation of speech, language and hearing disorders; interrelationships among the fields of audiology, education of the deaf and speech-language pathology.

90. Phonetics of American English (3). Perceptual and physiological characteristics of American English speech sounds; application of phonetics to the study of normal and abnormal speech patterns and regional dialects. (2 lecture, 2 lab hours)

95. Introduction to Verbal Development (3). Study of normal verbal development; compilation of developmental milestones in speech and language, acquisition.

102. Speech Science I: Anatomy and Physiology (3). Physical, physiological and neurological bases of the speech and hearing mechanisms.

103. Speech Science II: Acoustics and Perception of Sound (3). Anatomy and physiology of the ear; acoustics of speech and hearing, and perception of sound. (2 lecture, 2 lab hours)

104L. Physiology and Anatomy Laboratory (1). Prerequisite: C D 102 (or concurrently). Laboratory study of anatomy and physiology of speech and language; cadaver dissection.

105. Disorders of Articulation (3). Prerequisite: C D 80, 90, 95, 102. Seminar in the process of articulation; assessment, prognostic and therapeutic procedures related to articulation disorders. (2 lecture, 2 lab hours)

106. Written Language Skills for Teaching the Communicatively Handicapped (3). Prerequisite: Engl 1. Analysis of the structural written language of normally developing children for comparison with language handicapped children. (Former C D 106W)

107. Observation in Communicative Disorders: Speech-Language Pathology (1–3; max total 3). Observation of diagnostic evaluations, parent counseling and clinical services in the Language, Hearing and Speech Clinic, in the public/private schools and related clinical settings.

108. Field Experience in Communicative Disorders: Education of the Deaf (1–3; max total 3). Observation of diagnostic evaluations, parent counseling and educational/clinical services at clinical sites on campus, in public and/or private schools, and at residential schools for the deaf.

109. Disorders of Language (3). Prerequisite: C D 80, 90, 95, 102. Seminar in the description and analysis of language disorders in children; assessment, prognostic and therapeutic procedures related to language disorders in both children and adults. (2 lecture, 2 lab hours)

110. Diagnostic Procedures (3). Prerequisite: C D 80, 90, 95, 102, 103, 105 must be taken concurrently with C D 107 (1 unit). Seminar in the selection and use of various speech, language, voice, and prosody tests and procedures used in the diagnostic process. (2 lecture, 2 lab hours)

112. Voice Disorders (3). Prerequisite: C D 80, 90, 95, 102. Seminar in normal and deviant vocal productions; assessment, prognostic and therapeutic procedures related to voice disorders. (2 lecture, 2 lab hours)

113. Introduction to Birth Defects (3). Etiology, physical characteristics, diagnosis, treatment and prognosis of genetic and non-genetic syndromes. Implications of various diagnoses for the health professional. Discussion of newborn and carrier screening, prenatal diagnosis, local services, genetic counseling and ethical considerations.

114. Education of Exceptional Children (3). Identification of common and differentiating characteristics of exceptional children. Diagnostic and instructional programs, legal provisions and certification requirements. Observation in clinical sites on and off campus, public and/or parochial schools. (2 lecture, 2 lab hours)

115. Disorders of Fluency (3). Prerequisite: C D 80, 90, 95, 102. Seminar in the description and analysis of disorders of fluency.

116. Prescriptive and Individualized Instruction (3). Prerequisite: C D 80, 90, 95. Development and examination of methods and materials relative to individual learning problems; study of models and individual programs. (2 seminar, 2 lab hours)

128. Observation in Communicative Disorders: Audiology (1–3; max total 6). Observation of audiologic testing; practice in audiological testing; practice in interpreting test results.

130. Clinical Practice in Speech and Hearing Therapy (1–3; max total 12). Prerequisite: C D 80, 90, 95, 102, 103, 105, 107, 110. Supervised clinical practice in speech and hearing therapy; diagnosis of speech deficiencies, referral procedures, parent counseling, case records. Clinical sites on campus, satellite centers, public and/or private schools. (Lab fee, $10)

131. Principles of Audiology (3). Prerequisite: concurrent enrollment in C D 128. Definition of hearing loss and the medical aspects of hearing loss; an introduction to hearing conservation; testing procedures utilized in detection and evaluation of hearing loss; basic interpretation of diagnostic test results.

133. American Sign Language (3). Introduction to a language developed in a visual/gesture mode and used by the general deaf population. Emphasis on principles of American Sign Language, especially grammatical structure and basic lexicon. Basic conversational skills for communicating with deaf children and adults. (Former C D 138)

135. Sign Language for Classroom Use (3). Prerequisite: C D 133. Development of signing skills necessary to teach and communicate with the deaf in a classroom or other professional settings. (Former C D 136)

137. History, Education and Psychology of Deafness (4). Prerequisite: concurrent enrollment in C D 108. History of the education of the deaf; research studies related to psychology, social adjustments and learning problems of deaf; psychological implications and effects of deafness on families, cultural and social aspects of deafness; school records and testing procedures. (May include lab hours.)

140. Behavior Modification for the Multihandicapped Deaf (3). Prerequisite: permission of instructor. Techniques of adapting behavior modification principles with multihandicapped deaf children. Includes contingency contracting, positive reinforcement, charting behavior and videotaped observations.

150. Clinical Practice in Audiology (1–3; max total 12). Prerequisite: C D 80, 90, 95, 102, 103, 128, 131. Supervised clinical practice in the diagnosis and treatment of hearing problems, parent counseling, therapeutic planning, etc. (Lab fee, $10)

160. Clinical Practice in Education of the Deaf (2; max total 6). Prerequisite: C D 135, 162, 163, 164. Supervised clinical participation and practice in clinical/classroom teaching of persons who are deaf and severely hard of hearing; parent counseling. Therapy planning and implementation; clinical sites on campus and public and/or private schools. (Lab fee, $10)

162. Speech for the Deaf (3). Prerequisite: C D 80, 90, 95, 106. Seminar in techniques employed in the development of speech with deaf children. Yale charts and diacritical marking systems. Devices for developing all English sounds. Includes observation, demonstration and practice with deaf children.

163. Language for the Deaf (3). Prerequisite: C D 80, 95, 106. Seminar in techniques employed in the development of language with deaf children; construction of English sentences and grammar; methods of correcting language mistakes of the deaf child; comparative studies of various language curricula.

164. Elementary School Subjects for the Deaf (3). Prerequisite: C D 80, 95, 106, and permission of instructor. Seminar in detailed study of the process of teaching reading to deaf children. Investigation of classroom procedure and presentation of content areas (math, science, social studies); integration with visual instructional materials. Includes observation and demonstration. (2 lecture, 2 lab hours)

164A. Student Teaching: Speech and Hearing Handicapped (4–9; max total 9). Prerequisite: 4–6 units of C D 130 or 230, including 150 hours of therapy; admission to the credential program. To be taken concurrently with C D 209. Directed observation, participation and clinical practice (120 hours minimum) under supervision. Weekly conference with university supervisor. (Lab fee, $10) (Former A S 164A)

164B. Student Teaching: Deaf and Hard of Hearing (4–9; max total 9). Prerequisite: 4 units of C D 160 or 260; approval by a departmental review committee; admission to the credential program. Teaching under supervision in a class for the deaf or hard of hearing. Directed observation, participation and weekly conference with university supervisor. (Lab fee, $10) (Former A S 164B)

164C. Student Teaching: Audiology (4–9; max total 9). Prerequisite: permission of instructor and admission to the Credential Program. Directed observation, participation and supervised clinical practice (100 hours minimum) in the school setting. Conferences with university supervisor as arranged. (Lab fee, $10)

188T. Topics in Communicative Disorders (1–3; max total 6). Speech pathology, audiology, education of the deaf, speech and hearing science, language disorders.

190. Independent Study (1–3; max total 6). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.*)

200. Graduate Studies and Research in Communicative Disorders (3). An introduction to graduate studies and methods of research in communicative disorders. A review of the concepts and methods of science and clinical research designs; and professional and scientific writing skills.

202. Aural Rehabilitation (3). Prerequisite: C D 128, 131, 133. A review of current habilitative/rehabilitative procedures employed in assisting the hearing impaired, including amplification, communication rehabilitation (speech-reading, auditory training, speech and language) and psychosocial issues. (2 lecture, 2 lab hours)

204. Seminar in Stuttering (3). Prerequisite: permission of instructor. In-depth study of specific characteristics, causes, and therapeutic approaches to remediating stuttering.

206. Seminar in Phonological Disorders (3). Prerequisite: C D 90, 95, 105, 107, 110. Seminar in the phonological and articulatory processes and disorders in both the first and second language production; review of assessment and treatment procedures and research trends.

207. Aphasia in Adults (3). Prerequisite: permission of instructor. Seminar in the history of aphasia; neurological concepts needed for understanding this disorder; application of linguistic theory to testing and therapy; formulation of programs for aphasics.

209. Speech-Hearing in Public School Environment (1). Prerequisite: concurrent enrollment in C D 164A. Seminar in selection, application, and interpretation of diagnostic tests for public school children; demonstration and application of therapy for children with a variety of language, hearing, or speech disorders; organization and administration of school speech and hearing program.

210. Seminar in Structural Speech Disorders (3). Prerequisite: permission of instructor. Theories, etiologies, and habilitative processes. Emphasis given to orofacial growth and cleft palate.

212. Management of Severe Language Disorders (3). Prerequisite: C D 109 and permission of instructor. Seminar in assessment and remediative approaches to severe language delayed and disordered children. Causation, assessment and remedial approaches for semantic, syntactic, and morphologic disorders.

213. Seminar in Neurological Speech Disorders (3). Prerequisite: C D 102. Symptomatology, etiology, habilitative and rehabilitative processes related to neurological speech disorders of children and adults.

214. Seminar in Language Disorders of Children (3). Prerequisite: C D 95, 109. Etiology, symptomatology, assessment and habilitation of language disorders in children. Practical experience includes diagnosis and management of a child's language disorder. Clinic sites on campus and in public and/or private schools.

230. Advanced Clinical Practice in Speech and Hearing Therapy (1–3; max total 12). Prerequisite: C D 80, 90, 95, 102, 103, 105, 107, 110. Supervised clinical practice in diagnosis/treatment of complex speech and hearing problems; causative factors; outlining therapy; parent counseling; referrals. Clinic sites on campus, in satellite centers and public and/or private schools. (Lab fee, $10)

231. Audiology II (3). Prerequisite: permission of Instructor. Advanced differential diagnosis procedures; special problems in audiology related to nonorganic hearing loss, central auditory loss, the "dizzy" patient and the difficult to test patient. (2 lecture, 2 lab hours)

232. Seminar in Pediatric Audiology (3). Prerequisite: C D 231 and permission of instructor. An in-depth study of auditory disorders in children, their clinical manifestations and audiologic management. Normal and abnormal development, identification and evaluation procedures, differential diagnosis and management procedures are included.

233. Seminar in Analysis of Hearing Aids (3). Prerequisite: C D 131, 231 (or concurrent) and permission of instructor. An in-depth study of various amplification devices in the rehabilitation of the hearing impaired. Electroacoustic analysis, psychoacoustic measurements, various coupling devices and methods of selection, fitting, dispensing and follow-up are included.

234. Seminar in Industrial Audiology (3). Prerequisite: permission of instructor. Principles of industrial hearing conservation and the design of a comprehensive plan for a specific industry. (2 lecture, 2 lab hours)

235. Seminar: Instrumentation in Communicative Disorders (3). An in-depth study of information relating to basic electroacoustic principles, test calibration equipment and procedures, signal generation, recording, storage and analysis, as well as information relating to specific instrumentation for clinical and research uses related specifically to communicative disorders. (2 lecture, 2 lab hours)

240. Advanced Seminar in Audiology (3). Prerequisite: permission of instructor. An in-depth study of selected professional topics and issues, including advanced auditory brainstem response testing, electronystagmography, professional practice, and counseling with the hearing impaired.

250. Advanced Clinical Practice, Audiology (1–3; max total 12). Prerequisite: C D 80, 90, 95, 102, 103, 128, 131. Supervised clinical practice in diagnosis and treatment of complex hearing problems; causative factors, counseling parents, therapy planning, etc. (Lab fee, $10)

260. Advanced Clinical Practice, Education of the Deaf (2; max total 6). Prerequisite: C D 135, 162, 163, 164, 202. Supervised clinical participation and practice in clinical/classroom teaching of persons who are deaf and severely hard of hearing; parent counseling. Therapy planning and implementation. Clinical sites on campus and in public and/or private schools. (Lab fee, $10)

262. Seminar in Speech for the Deaf (3). Prerequisite: C D 162, 202, permission of instructor; and successful completion of the NTE (General Knowledge — Core Battery) or a Single or Multiple Subjects Credential. Development of oral communication for deaf child. Detailed study of essentials of good speech and methods to build or correct speech of the deaf. Projects in library research or experimentation. Includes demonstration and off-campus practicum. (2 lecture, 2 lab hours)

263. Seminar in Language for the Deaf (3). Prerequisite: C D 163, permission of instructor; and successful completion of the NTE (General Knowledge — Core Battery) or a Single or Multiple Subjects Credential. Investigation of language errors of the deaf. Techniques with deaf students. Specialized equipment and production of materials used in the classroom for the deaf. (2 lecture, 2 lab hours)

264. Seminar in Elementary School Subjects for the Deaf (3). Prerequisite: C D 164 and successful completion of the NTE (General Knowledge — Core Battery) or a Single or Multiple Subjects Credential. Special problems and techniques of adjusting the elementary school curriculum to the needs of deaf children; innovations and research in curriculum development. Project required. Includes demonstration and practice.

267. Internship in Speech-Language Pathology (1–6, max. 12). Prerequisite: 2–6 units of C D 130 or 230 and permission of instructor. Supervised internship in speech-language pathology. Diagnosis and management of speech and language conditions. *CR/NC* grading only. (Lab fee, $10)

268. Internship with the Deaf (6). Prerequisite: C D 135, 164B, 262, 263, 264, and successful completion of the NTE (General Knowledge — Core Battery) or a Single or Multiple Subjects Credential. Supervised internship in a residential school for the deaf. Full time in residence for 8 weeks. *CR/NC* grading only. (Lab fee, $10)

269. Internship in Audiology (1–6). Prerequisites: C D 202, 231, 232, 233 and permission of instructor. Supervised internship involving the diagnosis and management of various audiologic conditions. *CR/NC* grading only. (Lab fee, $10)

270. Seminar in Organization and Management of Speech, Language and Hearing Clinics (1–3). Prerequisite: permission of instructor. Elements of leadership in communicative disorders program. Establishing, organizing and maintaining speech, language and hearing clinics in colleges and universities, public schools, hospitals and private organizational settings.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

298. Individual or Group Research Project (1–6; max total 6). Prerequisite: consent of advisory committee. See *Criteria for Thesis and Project.* Utilization of communication research principles and techniques to select study design, determine data collection techniques, collect and process data, interpret findings and prepare final written report. Same standards as for thesis. Approved for *SP* grading.

299. Thesis (2–6; max total 6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis or project for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

300T. Selected Topics in Communicative Disorders for Continuing Education (1–3).

Computer Science

School of Natural Sciences
Department of Computer Science
Henderson C. Yeung, Chair
McKee Fisk Building, Room 207
(209) 278-4373

B.S. in Computer Science
Minor in Computer Science

Computer science is applied reasoning using both art and science: It requires the ability to communicate ideas through a combination of language and powerful technology. It is concerned with the interaction of man and machine, and man's conquest of the future through continuing developments in the application of computers to a myriad of common and specialized problems.

The goal of the Department of Computer Science is to offer programs to a diverse audience: (1) students interested primarily in computing, (2) students interested primarily in applying computing to some other field of study, and (3) students who wish to include computing as part of their general undergraduate education.

For the computer science major, the department offers courses that represent both the core of study considered essential to all aspects of computing and advanced study sequences in particular fields of interest. The core classes introduce all majors to the wide spectrum of thought represented in computing. The advanced sequences allow the individual student to pursue concentrated work within such areas as computer architecture, artificial intelligence, data bases, compilers, operating systems and computer science theory. The department also offers topics courses intended to keep students informed of current advances and methodology in computing.

In addition to courses designed for majors, the department also offers courses intended to introduce computing to non-majors. These courses will benefit any major who wishes to include computer literacy in their undergraduate study.

The bachelor's degree in computer science prepares students for careers in the computing industry or for graduate study. Combined with a minor in any other field of study, the bachelor's degree will allow students to utilize their computing expertise in a variety of specialized fields as well. The core and computer science theory courses are excellent preparation for students who intend to pursue an advanced degree in computer science.

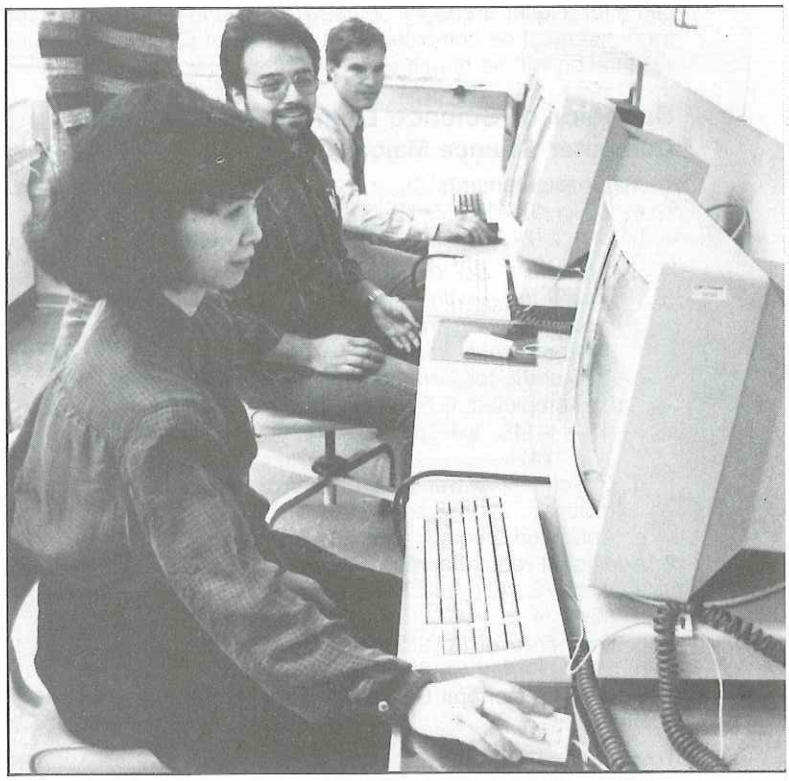
Faculty and Facilities

The faculty come from a variety of areas including computer systems and architecture, theoretical computer science, programming languages, software engineering and applied mathematics. They have in common a desire to provide a program that will give the student a broad range of experience in computer science as well as the depth of education that will be needed in the student's later career, whether professional or academic.

The department maintains a DEC VAX 11/785, an AT&T 3B15, a NeXT computer, a terminal laboratory, and a lab of networked Sun Microsystems UNIX-based A.I./Graphics workstations.

Career Opportunities

Computer use is pervading all aspects of our society, and the industry supporting that use has been growing rapidly for several decades. Graduates from this program find job opportunities in such diverse fields as computer design, software development, systems analysis, data base design, and technical programming. Because of the strong theoretical orientation of our program, graduates are attractive to companies involved in computer manufacturing and to those industries using computers in high technology applications. Our proximity to two of the largest computer use areas in the nation, Silicon Valley and Los Angeles, provides our graduates with a flourishing and broad-based collection of potential employers. Graduates have also obtained exciting



and challenging positions at Air Force and Naval bases in California. We expect that a high proportion of our graduates will pursue postbaccalaureate studies.

Organizations

Student chapters of the Association for Computing Machinery (ACM) and the IEEE Computer Society are very active in the department. The ACM chapter organizes field trips to major computer manufacturers and users in California. It also sponsors the fall CSUF Programming Contest and the annual International Computer Problem Solving Contest for precollege students.

Computer Science majors who have a distinguished academic record in computer science are invited to join Upsilon Pi Epsilon, the national computer science honor society.

Co-op Program

Through the Cooperative Education program the department encourages full-time employment for students for one semester in computer-related positions. This is an excellent opportunity for a student to obtain experience, a reasonable salary and college credit in this field.

Faculty

Henderson C. Yeung, *Chair*

Brent J. Auernheimer	Walter Read
John D. Holt	Shigeko Seki
Lan Jin	Grace C. N. Yeung

Grade Requirements

All courses taken to fulfill major course requirements must be taken for a letter grade. All courses required as prerequisites for a course must be completed with a grade of *C* or better before registration will be permitted.

Bachelor of Science Degree Requirements

Computer Science Major

	Units
1. Major requirements	49–50
a. C Sci 40, 41, 112, 115, 117, 119, 154	(25)
b. C Sci 124, 134, 144, 150*, 164, 174*, 186	(12)
* *If both C Sci 150 and C Sci 174 are used to fulfill the requirements in line 1b, they cannot be used together as a group to fulfill the requirements in line 1c.*	
c. Two of the following sequences or groups must be completed: C Sci 124–126, 134–136, 144–146 or 144–148, 164–166, 186–188, any two of (150, 172, 174)	(6–7)
d. C Sci 198, C Sci 191T or a third sequence or group	(3)
e. Approved Elective	(3)
2. Additional requirements	23–25
a. Math 75, 76 (Math 77 recommended)	(8)
b. Math 14 or 114	(3)
c. Phys 2A-B or Phys 5A-B	(8–10)
d. ECE 85 and ECE 85L or C Sci 113A	(4)
3. Remaining General Education requirements	45**
4. Electives	4–7
Total	124

** Of the 51 required General Education units, 6 are satisfied by Phys 2A or 5A (Division 1) and C Sci 40 or Math 75 (CORE).

Computer Science Minor

The Computer Science minor requires 20 units of Computer Science courses consisting of C Sci 40, C Sci 41, and 12 units of upper-division Computer Science courses.

COURSES

Computer Science (C Sci)

1. Critical Thinking and Computer Science (3). Prerequisite: intermediate algebra. Overview of the field of computer science for non-majors with an emphasis on critical thinking skills. Problem-solving strategies, algorithm design and data abstraction. Introduction to hardware, theoretical limitations of computers and issues arising from the growing role of computers in society. General Education CORE, Critical Thinking.

7. Computer Literacy (2). An introduction to the computer for interdisciplinary students. Overview of the history of computing, a presentation of the components of computer hardware and software systems, a study of applications, programming, societal impact and the future of computing. (1 lecture, 2 lab hours)

10. Introduction to BASIC Programming (1). Prerequisite: elementary algebra. Introduction to structured programming techniques using the programming language BASIC. Topics include input/output, branching, looping, subroutines and computer graphics. No prior experience required.

15. C Programming (2). Prerequisite: programming experience in a major high-level language (e.g., BASIC, COBOL, FORTRAN, Pascal). An introduction to the C programming language. Types, operators, expressions, flow of control, functions, pointers and arrays. Standard libraries and programming tools. Emphasis on programming projects.

20. Introduction to Computer Programming (4). Prerequisite: ELM Exam, intermediate algebra and trigonometry. Introduction to programming in FORTRAN with emphasis on program design, debugging and documentation. Elementary applications and structured programming for algorithm development. General Education CORE, Quantitative Reasoning. (3 lecture, 2 lab hours) (CAN CSCI 4)

40. Computer Programming (4). Prerequisite: ELM Exam, intermediate algebra and trigonometry. Introduction to problem solving, algorithm development, procedural and data abstraction; program design, coding, debugging, testing and documentation; programming language Pascal. General Education CORE, Quantitative Reasoning. (3 lecture, 3 lab hours)

41. Introduction to Data Structures (4). Prerequisite: C Sci 40. Programming methodology, program correctness. Review of data types. Data structures: linear and nonlinear structures, files. Implementation of data structures. Recursion. Searching and sorting. (3 lecture, 2 lab hours)

101. Computer Applications in the Sciences (3). Prerequisite: intermediate algebra; calculus recommended. Introduction to computers with emphasis on microcomputers. Preparation, storage, and processing of scientific data, documents, and illustrations; graphing, manipulating, and simple statistical analysis of data; computer-to-computer communications and file transfers; use of CSU network resources; introduction to computer languages. (2 lecture, 2 lab hours)

105T. Workshop on Computer Languages (1–3). Prerequisite: C Sci 40 or permission of instructor. Workshops in the use of various high-level programming languages or other selected languages in areas of data base, statistical computation or operating systems.

112. Introduction to Computer Systems (4). Prerequisite: C Sci 41. Boolean algebra, combinational logic, elementary digital circuits. A comparison of several assembly languages with an in-depth study of the organization of a particular computer. (3 lecture, 2 lab hours)

113A. Introduction to Computer Organization (4). Prerequisite: C Sci 41. The organization and structuring of the major components of a modern computer: combinational circuits, sequential circuits, simulation of circuits, coding, computer organization and architecture. A detailed study of a microcomputer or minicomputer. (3 lecture, 2 lab hours)

115. Algorithms and Data Structures (3). Prerequisite: C Sci 41. Review of basic data structures. Graph, search paths and spanning trees. Algorithm design and analysis of sorting, merging and searching. Memory management, hashing, dynamic storage allocation. Integration of data structures into system design.

117. Structures of Programming Languages (4). Prerequisite: C Sci 41 and (C Sci 112 or ECE 116). Examination of general concepts of programming languages; scope and binding rules, applications and implementations of language concepts. A study of two or more of the following languages; ADA, ALGOL, PL/I, MODULA 2, PROLOG, SNOBOL, LISP, C. (3 lecture, 2 lab hours)

119. Introduction to Finite Automata (3). Prerequisite: C Sci 41 and (Math 14 or 114). Strings, languages and fundamental proof techniques. Regular expression, regular grammar, regular languages, finite automata, their interrelationship and their properties. Introduction to context-free languages.

124. Introduction to File Processing (3). Prerequisite: C Sci 115. Definition of file components, access methods and file operations. Algorithms for efficient implementation of data structures; characteristics of bulk storage media for mainframe and microcomputers. Introduction to database management systems. (Spring semester)

126. Data Base Systems (3). Prerequisite: C Sci 124. Data base concepts; hierarchical, relational and network models. Data normalization, data description languages, data manipulation languages and query design. (Fall semester)

134. Compiler Design (3). Prerequisite: C Sci 115, 117, 119. Syntax and semantics of programming languages. Lexical analysis, parsing techniques, parser generator, SLR and LALR parsing. Introduction to symbol table organizatioin and semantic routines. Compiler generators. (Fall semester)

136. Compiler Construction (3). Prerequisite: C Sci 134. Advanced topics in compiler design. Type checking. Run-time storage management. Intermediate code generation. Interpreters. Error recovery techniques. Code generation and optimization. (Spring semester)

144. Introduction to Operating Systems (3). Prerequisite: C Sci 41 and (C Sci 112 or ECE 116). Operating system history and services. File systems. Memory management. Process management — concurrent processes, communication, semaphores, monitors, deadlocks. Resource management — processor and disk scheduling. Security and protection mechanisms.

146. Systems Architecture (3). Prerequisite: C Sci 113A, 144. An in-depth analysis of one or more operating systems — system data structures, hardware architecture, shell and kernel functions, I/O routines, interrupt handling. Other topics may include parallel hardware architectures, performance analysis. (Spring semester)

148. Systems Programming (3). Prerequisite: C Sci 113A, 144. Topics include implementation of operating system components and modification of existing systems. Device drivers, memory management, communication networks, and file systems will be examined. Projects will be emphasized.

150. Introduction to Software Engineering (3). Prerequisite: C Sci 41. History, goals, and motivation of software engineering. Study and use of software engineering methodologies. Requirements, specification, design, implementation, testing, verification, and maintenance of large software systems. Team programming.

154. Simulation (3). Prerequisite: (Math 14 or Math 114), Math 75, C Sci 41. Simulation as a tool for the study of complex systems in computer science, statistics and operations research. Generating random variables. Review of principles behind and examples of simulation languages.

164. Artificial Intelligence Programming (3). Prerequisite: C Sci 117. Introduction to functional programming and applicative languages via LISP. Production systems. Knowledge-based systems. Examples from: game playing, theorem proving, language processing. Introduction to logic programming and declarative languages via PROLOG. Introduction to expert systems. (Fall semester)

166. Principles of Artificial Intelligence (3). Prerequisite: C Sci 164. Automated reasoning including nonmonotonic logic. Topics from: robot planning, natural language processing, perception (computer vision, speech), learning. (Spring semester)

172. Computer Graphics (4). Prerequisite: Math 76, C Sci 112, 115. Introduction to algorithms and devices for construction and display of computer-generated images. Standard graphics packages are surveyed with applications to representation of two- and three-dimensional shapes, including hidden edges, shading, raster algorithms and dynamic image generation. (3 lecture, 2 lab hours)

174. Design and Analysis of Algorithms (3). Prerequisite: C Sci 115, 119. Models of computation and measures of complexity, algorithms for sorting and searching, set representation and manipulation, branch and bound, integer and polynomial arithmetic, pattern-matching algorithms, parsing algorithms, graph algorithms, NP-complete problems. (Spring semester)

186. Formal Languages and Automata (3). Prerequisite: C Sci 119. Introduction to formal language theory. Regular grammars, context-free grammars, context-sensitive grammars, unrestricted grammars; properties of context-free languages, push-down automata. (Spring semester)

188. Introduction to Computability (3). Prerequisite: C Sci 119. Introduction to Computability, effective procedures, algorithms; Turing machines, recursive functions, capabilities and limitations of effective procedures, the halting problem, computable functions and decidability. (Fall semester)

190. Independent Study in Computer Science (1–3). Approved for *SP* grading.

191T. Proseminar (1–3; max 15). Prerequisite: permission of instructor. Presentation of selected topics in computer science.

194. Cooperative Education (1–4; max 8). Prerequisite: courses appropriate to the work experience; approval by major department Cooperative Education Coordinator. Integration of work experience with academic program, individually planned through coordinator. *CR/NC* grading only.

198. Project (3). Prerequisite: senior standing in computer science and approved subject. See *Criteria for Thesis and Project*. Study of a problem under the supervision of a faculty member. A final report is required. Approved for *SP* grading.

IN-SERVICE COURSE *(C Sci)*

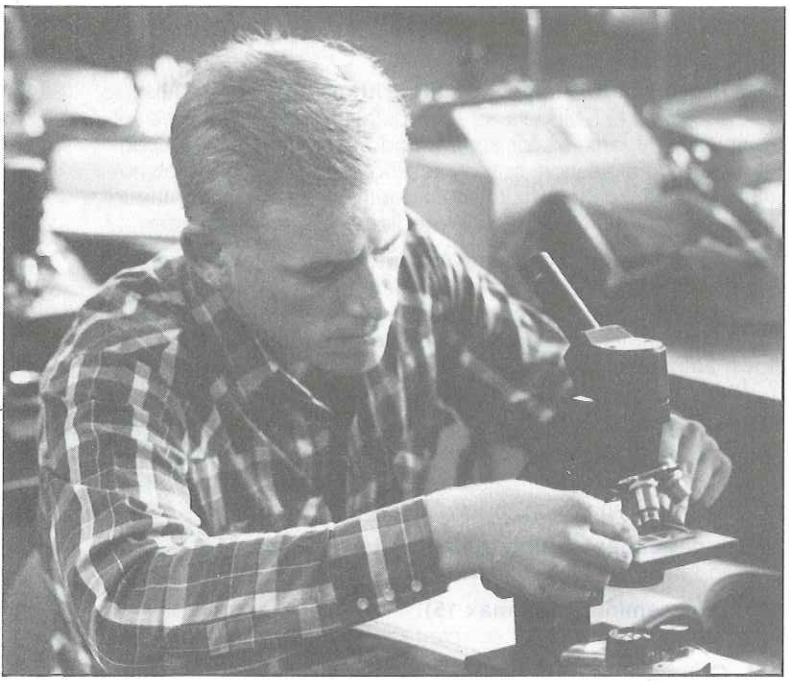
(See *Course Numbering System.*)

391T. Topics in Computer Science (1–6; repeatable with different topics). May be repeated for credit provided different topics are covered.

Criminology

School of Social Sciences
Department of Criminology
Max D. Futrell, Chair
McKee Fisk Building, Room 244
(209) 278-2305

B.S. in Criminology
Options:
Corrections
Law Enforcement
Minor in Criminology
M.S. in Criminology
Victim Services Certificate



The Department of Criminology provides undergraduate and graduate education in criminology for students planning professional careers in the criminal justice field. The program is diversified and integrated, reflecting the wide range of job opportunities in the field, including direct service and administration in law enforcement, corrections and juvenile justice. The department offers the Bachelor of Science degree, Master of Science degree and a minor.

Undergraduate Program

Criminology courses at the undergraduate level include integration of theoretical and applied materials of an interdisciplinary nature. The undergraduate curriculum is designed to prepare students for beginning professional work in criminal justice and to provide preparation for graduate work.

The corrections program is designed for students interested in careers in probation, parole, correctional institutions and other affiliated forms of work. The law enforcement program is designed for students interested in careers with federal, state and local law enforcement agencies, or law enforcement careers within the private sector. An internship course is required in both corrections and law enforcement options.

Graduate Program

The Master of Science degree in Criminology is a 30-unit, flexible program which provides a solid core in the field of criminology while permitting students to pursue specialized areas of interest. The master's program is designed to prepare students for service and responsible administrative and professional positions in agencies in the criminal justice system. The master's program also prepares students for a wide variety of occupations including in-service education, administrative education and management, community college teaching, marriage, family, and child counseling, predoctoral studies and research.

Justice Center

The department also administers a Justice Center that provides education, training, assistance and consultation to criminal justice agencies throughout the Valley. The Justice Center offers intensive seminars in areas of interest to working professionals. Some of these areas may include: victimology, drug abuse, alternative sentencing, juvenile justice, exclusionary rule, crime prevention and industrial security.

Faculty and Facilities

The criminology department consists of 14 full-time faculty members whose expertise includes numerous specialties in the criminal justice system, including corrections, counseling, victimology, juvenile delinquency, theory, legal studies, supervision and management, criminal justice administration, forensics and polygraphy. Various part-time faculty members from major criminal justice agencies also instruct in the department.

Career Opportunities

Many diversified local, state, federal and private agencies employ our graduates in criminal justice. On the local level, career opportunities exist at municipal police departments, county sheriffs' offices, probation departments, halfway and prerelease houses, group homes, crisis centers, juvenile halls, welfare fraud units, retail, and industrial security agencies. At the state level are the State Police, Department of Corrections, Alcohol and Beverage Control, prisons, Department of Motor Vehicles, Departments of Justice, Fish and Game, and Forestry. At the federal level there are the Border Patrol, FBI, Secret Service, Alcohol, Tobacco and Firearms, Internal Revenue Service, Park Service, Customs, Immigration and federal prisons.

Faculty

Max D. Futrell, *Chair*

John H. Burge
R. Thomas Dull
Steven D. Hopson-Walker
Caryn B. Horwitz
Ruth E. Masters
Barbara Owen
Robert F. Perez
Lester P. Pincu
John R. Quinn
D. N. Ray
Cliff Roberson
Doug Shannon
O. J. Tocchio

All advisers are listed above.

Bachelor of Science Degree Requirements
Criminology Major

	Units
I. Criminology — Corrections Option Major:	51
Lower-Division Requirements (see Note 1): Crim 2, 20, 31, 50, 73	(15)
Upper-Division Core (must be taken before or concurrent with other upper-division requirements): Crim 100, 102, 109, 112, 170 (See Note 6)	(15)
Upper-Division Requirements: Crim 118, 133, 134, 135, 139, 181 (See Note 8)	(18)
Crim Electives (one of the following courses): Crim 117, 119, 120, 136T, 140, 141, 153, 160T, 175, 176, 190	(3)
II. Criminology — Law Enforcement Option Major:	53
Lower-Division Requirements (See Note 1): Crim 2, 4, 20, 21, 31, 50, 73	(21)
Upper-Division Core (must be taken before or concurrent with other upper-division requirements): Crim 100, 102, 109, 112, 170 (See Note 6)	(15)
Upper-Division Requirements: Crim 113, 117, 180 or 108	(11)
Crim Electives (two of the following courses): Crim 118, 119, 120, 133, 134, 135, 136T, 139, 140, 141, 153, 160T, 175, 176, 190	(6)
III. General Education requirements	51
IV. Electives and remaining degree requirements *(see Degree Requirements)*; may be used toward a dual major or minor	24–26
Total	128

Notes:

1. Lower-division courses should be taken before upper-division courses.
2. Upper-division core should be taken prior to upper-division electives.
3. Department policy requires that students should see their advisers prior to registration each semester.
4. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy criminology major requirements.
5. *CR/NC* grading is not permitted in the major with the exception of Crim 108, 180, 181, and 281.
6. Crim 170 must be taken no later than the first semester of the student's junior year.
7. Any course that meets the upper-division writing skills requirement cannot be applied to the major requirements.
8. Crim 134 and 139 must be taken concurrently.
9. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.

Criminology Minor

	Units
Lower Division: Crim 2, 20	6
Upper Division: Crim 100	3
Select from upper-division criminology courses	12
Total	21

Note: Crim 100, 120, and 153 may still be used to meet requirements for both General Education and the minor, for those catalogs to which they apply.

Master of Science Degree Requirements

Under the direction of a graduate adviser, each student prepares and submits a coherent program individually designed within the framework below. Each student must see the graduate coordinator each semester prior to registering for courses.

All students must complete required core courses, and successfully complete a qualifying examination as a condition of advancement to candidacy.

	Units	
	Plan A	Plan B
Required courses in criminology 200 series (see specific requirements)	15	12
Electives in criminology or related areas 200 series (under special circumstances a maximum of 6 upper-division units may be allowed)	15	18
At least 21 units must be CSU, Fresno resident credit excluding credit by examination and 300-level coursework.		
Total	30	30

Specific Requirements:

Plan *A* — Thesis or Project Program: Crim 200, 201, 202, 203, and 298 or 299.

Plan *B* — Non-Thesis Program: Crim 200, 201, 202, 203.

All Plan *B* degree candidates must pass a comprehensive examination.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements, Foreign Language Requirements,* and *Criteria for Thesis and Project.*)

Victim Services Certificate

The Department of Criminology and SOEHD jointly offer the Victim Services Certificate. The purpose of this program is to provide appropriate educational experiences for matriculating students and practitioners. The certificate provides the opportunity for developing knowledge and skills necessary for individuals working with crime victims.

Program Prerequisites: (1) completion of 60 units of undergraduate coursework, and (2) completion of one general course in psychology, sociology, anthropology, health science, or child and family studies.

Program Requirements: A minimum of 12 units is required; three units must be taken in each of the four areas:

1. Theory	*Units*
Victimology (Crim 175)	3
2. Victim Issues	
Family Violence (Crim 140)	3
Child Abuse (EHD 107)	3
Domestic Violence (WS 116)	1
Rape (WS 108)	1
Incest (WS 109)	1
3. Service Delivery	
Victim Intervention and Counseling (EHD 108)	3
Victim Services (Crim 176)	3
Child Welfare (S Wrk 128)	3
4. Legal/Social Policy	
Education for Community Change (EHD 109)	3
Social Movements (Soc 122)	3

In addition, three units field experience (Crim 181) is available. For additional information or advising, contact the Department of Criminology.

Certificate in Alcohol/Drug Studies

The Department of Criminology is participating in a certificate of special study awarded to those students who successfully complete a minimum of 12 units of interdisciplinary academic coursework in the area of alcohol and drug abuse. (For complete details, see *Health and Social Work, Interdisciplinary Courses*, in this catalog.)

COURSES

Criminology (Crim)

2. Administration of Justice (3). Purpose, function, and history of agencies dealing with administration of justice; survey of criminal procedures; organization of law enforcement agencies at federal, state, and local levels; organization and functions of courts; probation, parole, and pardons; penology and prison administration. (CAN AJ 2)

4. Police Operations (3). Open only to criminology majors. Basic theories, objectives, and activities of police patrol and field operations.

10. Problems of Crime, Victims and Justice (3). An integrated approach to the study of contemporary criminal justice problems that affect society and the individual throughout his or her life. Volunteer or field assignments are required.

20. Criminal Law (3). Introduction to the case method of studying criminal law, theory, concepts, and philosophy of substantive law and criminal offenses; analysis of court decisions and opinions through case method. (CAN AJ 4)

21. Criminal Evidence (3). Fundamental questions of evidence and theory of proof through analysis of court decisions and opinions by case method, code sections, judicial notice, burdens of proof, presumptions and inferences, competency, hearsay, privilege, relevance, documentary evidence, and the exclusionary rule. (CAN AJ 6)

31. Interpersonal and Community Relations (3). The relationship of the criminal justice system and the community; nature and causes of complex problems in people to people relations in criminal justice.

50. Statistical and Computer Applications in Criminal Justice (3). Introduction to statistical and computer applications as they relate to criminological research and policy. Emphasis will be on basic statistical methods for the analysis of data and the application of appropriate computer techniques.

73. Criminal Justice Communications (3). Open only to criminology majors. The fundamentals of gathering and organizing data, and writing reports in the criminal justice system.

100. Criminology (3). Theories of criminal behavior; sociological factors; organized crime; professional criminals; selected types of social deviants and criminal offenders. General Education CAPSTONE Cluster, Critical Thinking.

102. Criminal Justice Organization and Management (3). Fundamentals of organization/management theory, principles, and processes relating to the operation and functioning of the criminal justice system.

108. Directed Policing (3; max total 12). Open only to criminology majors. Prerequisite or concurrently: Crim 4, permission of instructor and sponsoring agency. Supervised field experience in police work for interpreting theories developed in parallel criminology courses. Purchase of uniform required. Approved for *SP* grading. (Minimum of 6 field hours per unit.)

109. Comparative Systems of Criminal Justice (3). Study of selected criminal justice systems in other jurisdictions; examination of the organization; administration and operations of criminal justice agencies in the United States, Europe, the United Kingdom, and Asia.

112. Professionalism in Criminal Justice (3). Professionalism in criminal justice including formal and informal control, political activity, use of discretion, conflict of interest, rights of clients, and other current topics.

113. Forensic Science (5). Open only to criminology majors. Advanced study of scientific crime investigation, identification, and detection methods. (4 lecture, 3 lab hours)

117. Criminal Legal Process (3). Prerequisite: Crim 20. Specific emphasis on the laws of arrest, search and seizure, interrogation and confession, procedure prior to and during trial, post-conviction procedures, limitations on criminal prosecutions and juvenile proceedings.

118. Individual Rights in the Criminal Justice System (3). Prerequisite: Crim 20. Examines specific issues relative to the rights of individuals in substantive design of our criminal justice system. Deals with the development and protection of rights; surveys common abuses in the criminal justice system and their causes.

119. Juvenile Law (3). The history of juvenile law, the evolution of juvenile courts, and survey of current juvenile law and procedures.

120. Juvenile Delinquency (3). The problem of juvenile delinquency; portrait of delinquency; causal factors; agencies of justice; treatment process; programs for control and prevention. General Education CAPSTONE Cluster, Critical Thinking.

126. Women and Violence: Public Policy and the Law (3). (See W S 126.)

133. Correctional Institutions (3). Examination of institutional philosophy, theory, function and practice; historical and systems approach to incarceration; contemporary prison facilities; socio-psychological effects of incarceration; inmates and staff; institutional programs; parole; rights of the confined; institutional issues; future of corrections.

134. Criminal Justice Counseling (3). Student must take Crim 139 concurrently. An overview of counseling modalities and counseling techniques as practiced in criminal justice settings.

135. Issues and Trends in Community Corrections (3). Examination of community-based corrections issues and trends; alternatives to incarceration; offender diversion; restitution; community treatment facilities; probation; parole.

136T. Topics in Criminology (1–3; max total 12 if no topic repeated). Analysis of selected areas of criminology; deviant behavior; institutional and noninstitutional treatment; corrections; administration and management; law enforcement; criminalistics.

139. Criminal Justice Counseling Skills Practicum (3). Students must take Crim 134 concurrently. Fundamental counseling practicum including problem identification, listening, empathy, clarification, disclosure, confrontation, goal setting, evaluation, and ethics.

140. Family Violence (3). Typology and history of family abuse, including: legal guidelines; treatment approaches; emotional abuse; sexual abuse; spousal abuse; elderly abuse; and child abuse as a criminogenic factor.

141. Alcohol, Drugs, and Criminality (3). Drug and alcohol related criminal behavior and the response of the criminal justice system.

153. Psychology of Crime (3). Psychological bases of crime; motivation, alcoholism, economic and cultural pressures; forms of crime; criminal careers; psychology and the criminal justice system. General Education CAPSTONE Cluster, Critical Thinking.

160T. Topics in Crimes (1–3; max total 12 if no topic repeated). Intensive focus on particular crime categories, e.g., political, corruption, terrorism; corporate, computer, white collar, fraud, embezzlement; homicide, assassination, mass murder, sex crimes, violence, assault, rape, mayhem; property, burglary, robbery, piracy, professional pickpocketing, swindling, safecracking; organized; arson; environmental; other.

170. Research Methods in Criminal Justice (3). Prerequisite or concurrently: Crim 50. Must be taken no later than the first semester of the student's junior year. Research methodology; use of library resources; preparation and handling of materials in criminology; written report required.

175. Victimology (3). Introduction to victimology, with special emphasis on family violence, sexual assault, restitution, compensation, culpability, victim services, victim rights, vulnerability, victim surveys, and the international victimology movement.

176. Victim Services (3). Overview of community services dealing with victims, including social welfare services, crisis centers, medical services, criminal justice, and others. This course will focus on the role of a victim service agency as a new subsystem, with special emphasis on services.

180. Internship in Law Enforcement (1–12; max total 12). Open only to criminology majors. Prerequisite: Crim 4, permission of instructor and sponsoring agency. Relates student's classroom studies with occupational and professional experiences. Weekly conference with field supervisor. Transfer students should be aware that 12 unit total must include units previously earned; check with departmental adviser. Approved for *SP* grading. *CR/NC* grading only. (Minimum of 3 field hours per unit)



181. Internship in Corrections (1–12; max total 12). Open only to criminology majors. Prerequisite: Crim 133 and 135, permission of instructor and sponsoring agency. Relates the student's classroom studies with occupational and professional experiences. Weekly conference with field supervisor. Transfer students should be aware that 12 unit total must include units previously earned; check with departmental adviser. Approved for *SP* grading. *CR/NC* grading only. (Minimum of 3 field hours per unit)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.*)

200. Research Methods in Criminology (3). Prerequisite: Crim 170. Methods and techniques of research in criminology; research designs and models; statistical techniques; preparation and critique of a research paper.

201. History of Western Criminological Thought (3). Prerequisite: Crim 100. An historical approach to criminological theory in Western civilization. Special treatment to the theoretical underpinnings of contemporary United States criminological thought. Detailed analysis of major 18th, 19th, and early 20th century Occidental thought.

202. Law and Society (3). Prerequisite: Crim 117 or 118. Development of law and legal systems; social organization of law in society; roles; functions of law, including social control, change and conflict resolution.

203. Criminal Justice Administration (3). Prerequisite: Crim 102. A comprehensive assessment of the historical evolution of the criminal justice system, including current status and future growth organization/management theory and practice relating to criminal justice; individual research.

220. Seminar in Group Therapy in Criminal Justice Agencies (3). Prerequisite: Crim 200, 201, 202, and 203. The theory and practice of group therapy in criminal justice agencies. Use of transactional analysis concepts in describing group interactions.

221. Seminar in Family Counseling in Criminal Justice Agencies (3). Prerequisite: Crim 200, 201, 202, and 203. The theory and practice of family counseling in criminal justice agencies.

227. Seminar in Crime and Delinquency Prevention Programs (3). Prerequisite: Crim 200, 201, 202, and 203. Policies and programs for prevention and control of delinquency and crime; evaluation of specific programs; principles of prevention and control.

252. Seminar in Criminal Justice Personnel Administration (3). Prerequisite: Crim 200, 201, 202, and 203. The historical development of modern personnel theory and practice in criminal justice agencies; manpower, merit concepts, concepts of man and work, classification, training and compensation, collective bargaining and organizational communication.

255. Seminar in Criminal Justice Labor Relations (3). Prerequisite: Crim 200, 201, 202, and 203. The historical development of labor relations theory and practice in criminal justice agencies; legislation, court decisions, collective bargaining agreements, arbitration awards and fact-finding, and administrative law decisions.

270T. Problems in Criminology (1–6; max total 12 if no topic repeated). Prerequisite: Crim 200, 201, 202, and 203. Special problems in law enforcement or corrections; individual research in laboratory, library, or field work; formal written reports. Weekly conference with instructor.

281. Supervised Professional Experience (1–6; max total 6). Open only to criminology majors. Prerequisite: permission of instructor and selected agency. Supervised professional experience in law enforcement or correctional work. Approved for *SP* grading.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

292. Readings in Criminology (1–3; max total 3). Prerequisite: permission of instructor and chair, Criminology Graduate Committee. Individually directed readings in an area of special concern to the student's graduate program; appropriate written reports and evaluation required; individual student conferences. Approved for *SP* grading.

298. Project (2–4; max total 4). Prerequisite: Crim 200, 201, 202, and 203. See *Criteria for Thesis and Project.* Preparation and completion of a project demonstrating a significant undertaking such as implementing a program, evaluating an ongoing program, developing pilot studies of innovative ideas or implementing organizational change in the field of criminology, and submission of a written abstract. Approved for *SP* grading.

299. Thesis (2–4; max total 4). Prerequisite: Crim 200, 201, 202, and 203; see *Criteria for Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

302. Topics in Criminology (1–3). May be repeated for credit provided different fields are covered. Prerequisite: permission of instructor. Selected areas in the organization, administration and management of agencies engaged in the administration of justice; the police function; prosecution of criminal offenses; the correctional process, deviant behavior.

Economics

School of Social Sciences
Department of Economics
Linda Shaffer, Chair
Peters Business Building, Room 393
(209) 278-3916

B.A. in Economics
Minor in Economics

Economics is the social science that studies the way in which societies are organized to produce the goods and services that sustain and enhance the life processes of the community. As a fundamental scientific discipline, economics employs systematic analysis in the study of the production and distribution of income within and among nations. Since all social policy issues in modern societies have an economic dimension, the study of economics offers the student an opportunity to investigate the most important and exciting problems of political economy facing the world today.

Such topics as inflation, unemployment, collective bargaining, banking, international trade, and development have long been within the province of economics. More recently, the economic way of thinking has been extended to other areas. Economic theories have been used to explain crime rates, birth rates, class conflict, pollution, marriage decisions, migration, and many other topics involving human behavior. Not all economists would agree with these theories, but ongoing debate helps to make economics a lively and challenging discipline.

Economics majors acquire skills in critical and analytical thinking that contribute to an individual's intellectual independence and self-confidence in the problem-solving processes. In addition, economics majors confront the necessity of developing a broad view of the options facing mankind in organizing the production and distribution of income. The literature of economics presents widely diverse systems of political economic philosophy. The CSU, Fresno Department of Economics offers a well-developed and balanced curriculum encompassing the major schools of modern economic thought, including the neoclassical, Marxian and American institutionalist schools.

The program in economics at CSU, Fresno is designed to give the student maximum flexibility in the choice of courses offered for the economics major. A typical economics major might take courses in intermediate macroeconomic theory and statistics while also learning about global corporations in the third world, or Marxist economics, or pursue an independent study project on the foundations of supply-side economics. The economics major is designed to permit the student to pursue a broad liberal arts undergraduate degree, integrating the study of economics with other social sciences, humanities, natural sciences and business administration.

Faculty

The faculty of the department is staffed by professors whose primary professional commitment is to undergraduate education. Every member participates in the full range of teaching assignments from moderate sized sections of economics principles to small, upper-division classes (averaging 16 students). They offer a wide variety of courses ranging from the traditional core of intermediate micro and macroeconomic theory to problem-oriented courses, such as the economics of ecology, population, and government regulation. The background of the faculty, like its program offerings, represents a broad spectrum of intellectual tastes and professional specialties.

Career Outlook

Graduates of the department pursue a variety of challenging careers in industry, finance, education and government. The economics B.A. degree is an excellent foundation for graduate study in public administration and business. The undergraduate major in economics has also proved to be an ideal prelaw major. The faculty provides counseling on legal careers to students interested in this career option. A number of distinguished attorneys are graduates of the department.



Careers for professional economists fall into the following patterns:

1. Business — roughly one-third of all economists are employed by private firms both large and small, although big corporations, banks and insurance companies tend to employ larger staffs of economists.
2. Government — approximately one out of five professional economists works for a local, state or federal government agency. The federal government recognizes the importance of an economics degree at the undergraduate level by allowing members of the economics honor society (Omicron Delta Epsilon) to enter government service at the GS-7 level rather than at the GS-5 level for general college graduates.
3. Education — about 45 percent of all economists are involved in teaching the discipline, but employment at this level has become more difficult as overall university enrollments have declined. However, there is a reawakening of interest in teaching economics in the secondary and even primary grades as more states across the nation are beginning to mandate economics in the public schools curriculum.

Faculty

Linda Shaffer, *Chair*

Robert J. Allison
Paul D. Bush
James M. Cypher
Don R. Leet
Robert A. Minick
Grady L. Mullennix
Louis F. Pisciottoli
John A. Shaw, Jr.
Izumi Taniguchi
Edwin F. Terry

Bachelor of Arts Degree Requirements

Economics Major

Econ 40 and 50 are prerequisite to all upper-division courses in economics except those offered in extension. Any student planning graduate work is advised to take *additional mathematics and some foreign language.*

	Units
1. Major requirements	36
a. Core: Econ 40, 50, 100A, 100B, 101, 123, 131, 135	(24)
b. Economics electives (at least 12 units upper division)	(12)
2. General Education requirements	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a dual major or minor	37
Total	124

Notes:

1. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy Economics major requirements.
2. *CR/NC* grading is not permitted in the Economics major or minor.
3. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
4. Economics majors may not use Econ 40 or 50 for General Education BREADTH, Division 8.

Economics Minor

The minor in economics requires 18 units as listed below; 20 units are required for use in a credential program.

	Units
Econ 40, 50	6
Elect from: Econ 100A, 100B, 101	3
Economics electives (11 units required for credential program)	9–11
	18–20

Note: Econ 25, 40 and 50 may also count for General Education BREADTH, Division 8.

COURSES

Economics (Econ)

25. Introduction to Economics (3). Recommended for first semester freshmen. It is an introduction to the field of economics. It cannot be counted as part of the credit requirements for a major in Economics. Topics may vary according to current events. General Education BREADTH, Division 8.

40. Principles of Microeconomics (3). Prerequisite: Not open to first semester freshmen. Introduction to microeconomic theories of consumption, production, and income distribution; price determination and resource allocation under alternative forms of market organization; government regulation of economic activity; applied economic analysis and policy formation in selected topic areas. General Education BREADTH, Division 8. (Former Econ 1B) (CAN ECON 4)

50. Principles of Macroeconomics (3). Prerequisite: Economics 40. Introduction to macroeconomic theories of the determination of income, output, employment, and prices in the economy as a whole; the monetary system; governmental counter-cyclical fiscal, monetary, and income policies; economic growth; international economics; economic development; and comparative economic systems. General Education BREADTH, Division 8. (Former Econ 1A) (CAN ECON 2)

100A. Economic Theory: Microeconomic Analysis (3). Prerequisite: Econ 40, 50. Price mechanism and resource allocation under conditions of pure competition, monopolistic competition, oligopoly; theories of consumer's choice, cost, production, income distribution; nature of economic generalizations.

100B. Economic Theory: Macroeconomic Analysis (3). Prerequisite: Econ 40, 50. An examination of classical, Keynesian and post-Keynesian theories of the determination of the levels of income, output, and employment; the scientific and ideological implications of Keynesian thought; and the theoretical foundations of contemporary monetary and fiscal policies.

101. History of Economic Thought (3). Prerequisite: Econ 40, 50. Evolution of economics as a science; doctrines of different schools of thought — Mercantilists, Physiocrats, Historical School, Classical Economists; contributions of outstanding economists.

102W. Explorations in Economic Literature (3). Prerequisite: Econ 40, 50; Engl 1; upper-division standing. An investigation into important Economic ideas and issues through selected readings of either contemporary literature or classics in the history of economic thought or both. The class is conducted as a seminar with emphasis on student contributions. This course meets the Upper Division Writing Skills Requirement for graduation.

103. Economics of Inflation, Unemployment and Growth (3). Prerequisite: Econ 50. A theoretical and empirical analysis of the various types of inflation and unemployment in the United States economy.

104T. Contemporary Economic Problems (3). Prerequisite: upper-division standing or permission of instructor. Analysis of current economic issues which are of public interest and importance at the time the course is given.

105. Marxian Economic Theory (3). Prerequisite: Econ 40, 50. Marxian economic theory and its relevance for modern economic theory and analysis; Marx's value, production and distribution theory; modern developments of Marxian models.

107. Institutional Economics (3). Prerequisite: Econ 40, 50. Study of the literature of American institutionalism, e.g., Veblen, Commons. Systematic study of the process of institutional adjustments; interplay of ceremonial and technological aspects of economic activity; application of institutionalist theory to specific fields in economics.

108. Radical Traditions in Economics (3). Prerequisite: Econ 40, 50. Economic philosophies of the Utopian, Anarchist, Anti-Materialist, Marxist, and Fabian Socialist schools. Intensive examination of contemporary radical economic ideas and the radical critique of modern neo-classical economics.

109. Principles of Political Economy (3). Prerequisite: Econ 40, 50 or permission of instructor. A critique of political economy; political nature of applications of economic theory.

110. Economic History of the United States (3). Prerequisite: Econ 40, 50. Exploration and colonization to the present; economic factors in development of the United States; relationships of economic forces to historical, political, and social change.

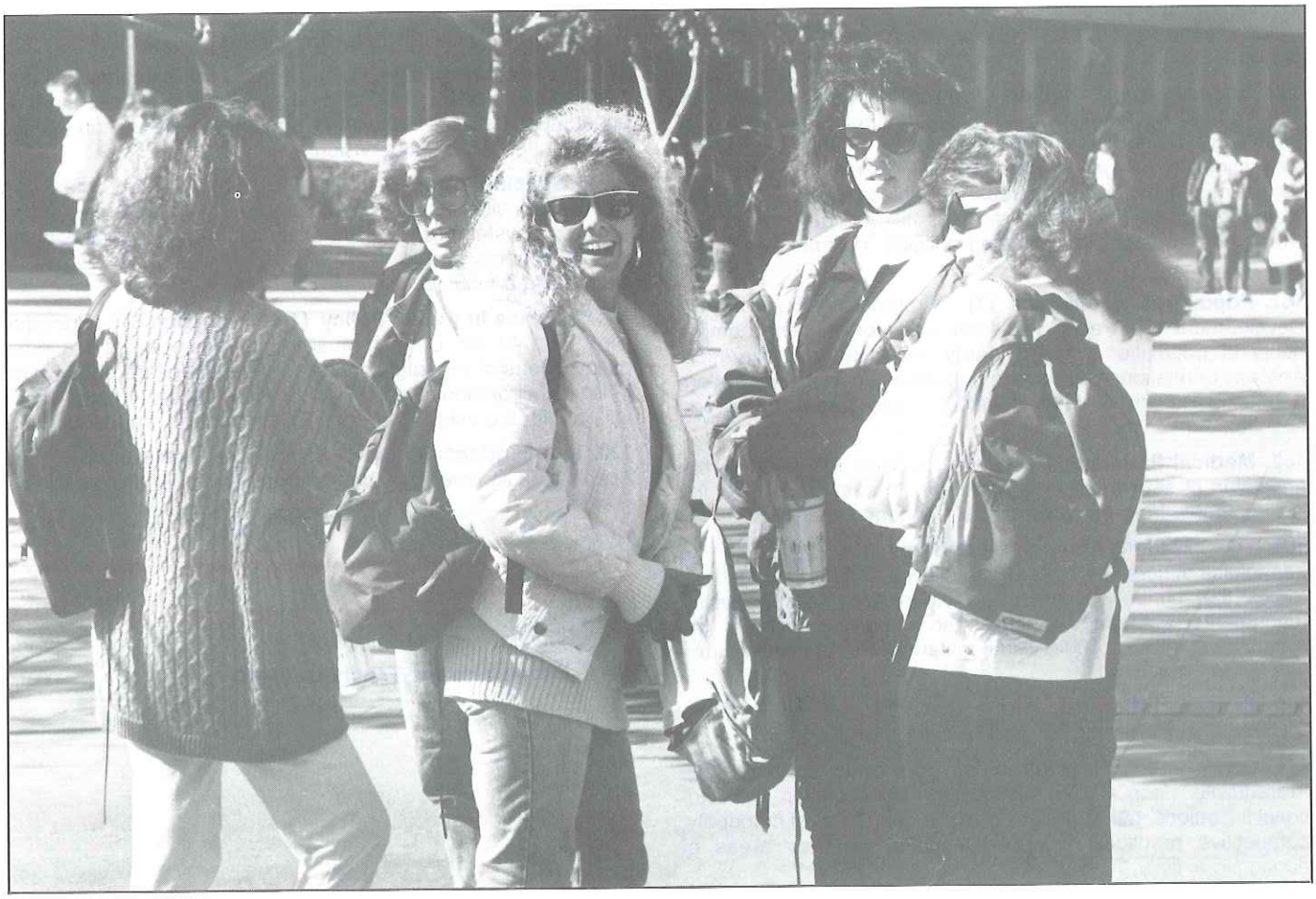
111. Economic Development of Europe (3). Prerequisite: Econ 40, 50 or permission of instructor. European expansion from the Middle Ages to present. Emphasis is placed on the causes of the Industrial Revolution and its spread throughout Europe; present economic conditions and trends in Europe; the interest of the United States in the European Economy.

114. Economic Development of Poor Nations (3). Prerequisite: Econ 40, 50. Intensive study of the causes and consequences of underdevelopment which affect two-thirds of the world's people. Topics include theories of development, historical roots of underdevelopment, evaluation of aid programs, New International Economic Order, Asian export economies, managing external debt.

115T. Topics in US Economic History (1–3; max total 6). Detailed investigation of developments in the United States economy. Topics vary with the needs and interests of students and faculty.

117. Economics of Ecology (3). Prerequisite: Econ 40, 50. Investigation into the economics of resource use. Development and creation of resources through the application of technology and the destruction of resources through misuse and pollution of the environment. General Education CAPSTONE Cluster, Critical Thinking.

123. Introduction to Econometrics (3). Prerequisite: Econ 40, 50; Math 11 or permission of instructor. Statistical data analysis in economics. Use of multiple regression analysis, time series analysis, index numbers. Basic theory; computer applications using major economic data sources; interpretation of results. (2 lecture, 2 lab hours).



125. Introduction to Mathematical Economics (3). Prerequisite: Econ 40, 50; Math 75. Introduction to uses of mathematics (primarily calculus and matrix algebra) in theoretical economic analysis. Knowledge of basic economics assumed; math is taught. Strongly recommended for students considering graduate work in economics or business.

131. Public Finance (3). Prerequisite: Econ 40, 50. Governmental revenues and expenditures at federal, state, and local levels of jurisdiction. Tax limitation measures, efficiency in government, subsidies, and fiscal relationships between different levels of government.

135. Money and Banking (3). Not open to students with credit in Fin 122. Prerequisite: Econ 40, 50. Survey of the monetary and banking system of the United States and analysis of its role in economic growth and stabilization.

140. The Political Economy of the Military-Industrial Complex (3). Prerequisite: Econ 50. Economic effects of military expenditures in historical perspective. Economic effects of World War II, Korea and Vietnam. The Military-Industrial Complex, war profiteering, and the economic effects of disarmament.

150. Labor Economics (3). Prerequisite: Econ 40, 50. Alternative theories of wages, employment and structure of labor market; impact of collective bargaining on level of wages, employment and labor's share of national income; history and philosophies of labor movement, structure and functioning of labor unions.

151. History of Labor in the United States (3). Prerequisite: Econ 40, 50. Analytical topics from historical viewpoint; evolution of unions and labor legislation interpreted in terms of economic theory.

152. Economics of Human Resources (3). Prerequisite: Econ 40, 50 or permission of instructor. Economic theory of investment in education and training; economic theories of discrimination; analysis of earnings differentials for women and ethnic minorities. Issues discussed include returns to class members' educational choices, affirmative action, comparable worth, and "manpower" planning policies. (Former Econ 188T section)

161. Population Economics (3). Prerequisite: Econ 40, 50. Development of an economic framework for studying components of population growth: fertility, mortality, and migration. Analysis of relationship between population change and modern economic growth in both developed and lesser developed nations.

162. Medical Economics (3). Prerequisite: Econ 40, 50. Examination of several aspects of the health care situation in the United States from the viewpoint of economic analysis.

165. The Modern American Economy (3). Not open to economics majors. Provides an overview of the major economic forces that shape our everyday experiences by introducing fundamental economic principles and applying them to the American economy. Audio-visual materials and computer simulations are presented.

170. Transportation (3). Prerequisite: Econ 40, 50. Economics of rail, water, motor, air, and pipeline transportation.

174. Government Regulation of Economic Activity (3). Prerequisite: Econ 40, 50. Justification for regulation, constitutional limitations, public utility regulation, regulation of monopoly; competitive practices; government policy in other areas of economic activity.

176. Economics Through Films (3). Prerequisite: Econ 40, 50 or permission of instructor. Emphasizes economic concepts, issues and institutions through an integrated series of classic films, lectures, and discussions. Students will apply economic theory to contemporary problems. (Former Econ 76)

178. International Economics (3). Prerequisite: Econ 40, 50. International economic relations; problems and policies in the light of fundamental economic theory.

179. Global Corporations and the Third World: The World Economy (3). Problems of economic underdevelopment in the Third World within the context of the world economy, nature and function of multi-national corporations, theories of economic imperialism.

180. Comparative Economic Systems (3). Prerequisite: Econ 40, 50. Comparative study of economic systems of the modern world; capitalism, socialism, communism, fascism, and the problems which arise within each.

181. Latin American Economic Development (3). Latin America's principal economic problems examined within a historical context. Topics may include Colonialism, Neo-Colonialism, foreign corporations, debt crises, problems of industrialization, agricultural backwardness. Intensive examination of major nations. Theories of development (structuralism, dependency, dualism, modernization) are integrated into case studies.

182. The Political Economy of China (3). Prerequisite: upper-division standing and/or permission of instructor. A survey and analysis of economic development in China and its linkages with politics, history, society, and foreign policy.

185. Directed Readings (1–3). Prerequisite: Econ 40, 50 and permission of instructor. Directed readings in the literature of economics. Intensive reading of economic literature on special topics under faculty supervision.

188T. Special Topics (1–3; max total 6). Prerequisite: Econ 40, 50. Consideration in depth of special topics in political economy; systematic, detailed study into issues not possible in survey courses. Topics vary with the needs and interest of students and faculty.

189T. Topics in Public Policy (1–3; max total 6). Prerequisite: Econ 40, 50. Detailed analysis of questions of economic policy. Areas of investigation include social welfare policy, farm policy, environmental quality policy, and others. Topics to be varied with the interests and needs of students and faculty.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

365T. Economics for Teachers (1–6).

EDUCATION
Advanced Studies

School of Education and Human Development
Department of Advanced Studies
H. Dan Smith, Chair
Ed/Psych Building, Room 123
(209) 278-2271

M.A. in Education/Administration and Supervision
Credentials:
Preliminary Administrative Services
Professional Administrative Services

M.A. in Education/School Counseling
Credential:
Pupil Personnel Services

M.S. in Counseling
Options:
Career Development Counseling
Marriage, Family and Child Counseling

M.A. in Special Education
Specialist Credentials:
Learning Handicapped
Severely Handicapped

The Department of Advanced Studies offers programs for credentials and master's degrees in the areas of educational administration, counseling and special education. The programs utilize the services and facilities of community agencies and school districts within the university service area.

Educational Administration. The Master of Arts in Education with an option in administration and supervision is a 30-unit degree program with a specialization in educational administration.

The Preliminary Administrative Services Credential Program is a 24-unit program that provides basic preparation for employment in a public school (grades kindergarten through 12) administrative position. The Professional Administrative Services Credential Program provides advanced preparation (minimum 24 units) and is taken following completion of the preliminary credential and successful employment as a school administrator.

Counseling. Two master's degrees are available in the field of counseling: the Master of Arts in Education with an option in school counseling and the Master of Science in Counseling. The M.A. degree is a 30-unit program for individuals seeking advanced preparation for counseling careers within educational settings. The M.S. degree is a 60-unit program designed for persons who desire professional preparation for the practice of career development counseling or marriage, family and child counseling in agency or private settings.

The Pupil Personnel Services Credential Program is a 36-unit program that provides preparation for the individual who desires to function as a school counselor in grades kindergarten through 12.

Special Education. The Master of Arts in Special Education is awarded after completion of a minimum 30 units. This degree provides opportunities for the development of special skills needed for the teaching of special populations including the learning handicapped and the severely handicapped.

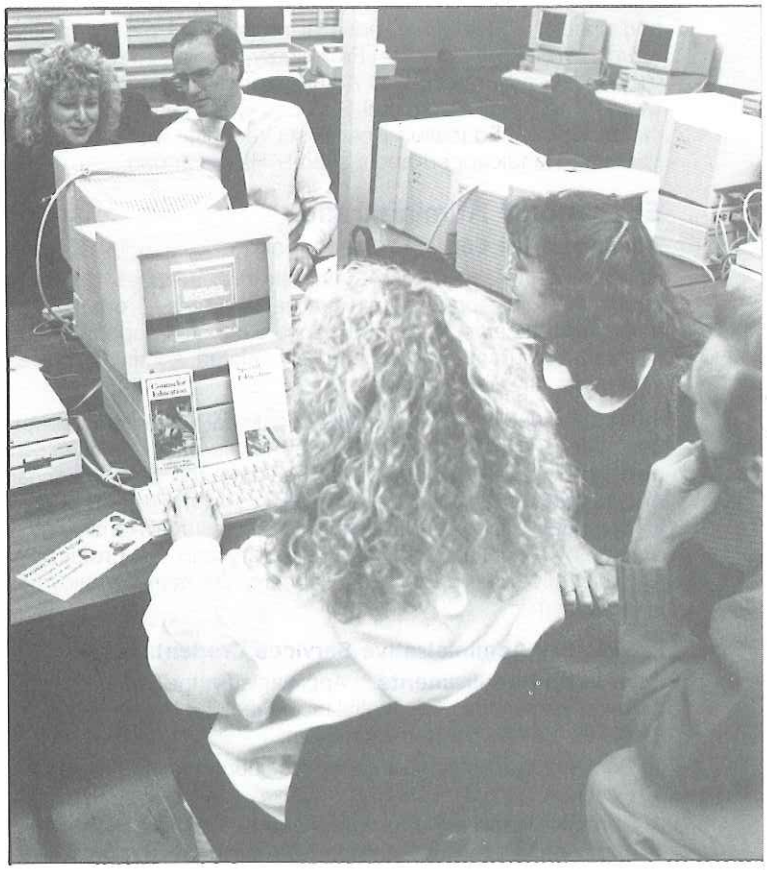
The Special Education Program provides preparation for two Special Education Specialist Credentials including Learning Handicapped and Severely Handicapped. Persons desiring to work with these unique populations in a school setting (grades kindergarten through 12) must possess the appropriate Special Education Specialist Credential.

Career Opportunities

Persons completing the educational administration programs could expect to serve in such positions as a school district superintendent, principal, program director and any related administrative assignments at all school levels.

Persons completing the counseling credential and degree programs may qualify to work in public schools, social agencies, colleges, career development settings, marriage and family counseling, and related areas. Completion of the M.S. in Counseling with the option in marriage, family and child counseling may fulfill the educational requirements for the State of California Marriage, Family and Child Counselor License.

Persons completing the special education credential and degree programs may seek employment in public school programs, clinics, resource classrooms, educational programs in hospitals and other agencies serving students with special needs.



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Credential Program Requirements

The Department of Advanced Studies offers programs leading to credentials in the fields of educational administration, counseling and special education. Credential programs provided include: *Educational Administration:* Preliminary Administrative Services Credential and Professional Administrative Services Credential; *Counseling:* Pupil Personnel Services Credential; *Special Education:* Special Education Specialist Credential with emphasis in Learning Handicapped and Severely Handicapped.

Educational Administration

Administrative Services Credentials

Holders of the Preliminary Administrative Services Credential and the Professional Administrative Services Credential are authorized to serve in such positions as district superintendent, principal, program director and any related administrative assignments at all school levels.

Individuals who wish to serve as educational administrators must complete preliminary and advanced levels of preparation. The preliminary level qualifies the candidate for the Preliminary Administrative Services Credential. The advanced level of preparation qualifies the candidate for the Professional Administrative Services Credential. Both the Preliminary and the Professional Administrative Services Credential carry the same employment authorization.

Preliminary Administrative Services Credential

Admission Requirements. Applicants for the Preliminary Administrative Services Credential must meet the following requirements for admission to the program:

1. Complete application for postbaccalaureate standing at CSU, Fresno.
2. Complete application for admission to a School of Education and Human Development graduate program.
3. Possess a GPA of 2.75+ over the last 60 semester units.
4. Obtain three letters of recommendation.
5. Provide evidence of having taken the California Basic Educational Skills Test (CBEST).
6. Be classified in a School of Education and Human Development graduate program.

Program Requirements. Candidates for the Preliminary Administrative Services Credential who have been admitted to the program and who want to be recommended for this authorization must meet the following requirements:

1. Possess a valid California Teaching Credential based on a bachelor's degree or a Pupil Personnel Services Credential.
2. Verification of three years of successful, full-time teaching experience in the public schools, or in private schools of equivalent status, or three years of experience in the field of pupil personnel work.
3. Completion of A S 261, 262, 263, 264, 265, 266, 267, 268.
4. Verification of training in the needs of and methods of providing educational opportunities to individuals with exceptional needs through completion of A S 111, T Ed 162, one year of full-time experience in special education, *or* 6 units of approved special education coursework.
5. Receive a passing score on the California Basic Educational Skills Test (CBEST).
6. Pass the competency exit review.
7. Have a completed master's degree.

Professional Administrative Services Credential

Admission Requirements. In addition to meeting all admission requirements for the Preliminary Administrative Services Credential, persons desiring admission to the Professional Administrative Services Credential Program must meet the following requirements:

1. Possess a GPA of 3.0+ over the last 60 semester units.
2. Hold a valid Preliminary Administrative Services Credential.

Program Requirements. Candidates for the Professional Administrative Services Credential who have been admitted to the program and who want to be recommended for this authorization must meet the following requirements:

1. Verification of a minimum of two years of full-time experience in public or private schools in a position requiring an administrative credential.
2. Completion of 16 units from A S 271, 272, 273, 274, 275, 277, 278T or 244 and 8 units of A S 279.
3. Completion of at least one-half of the required coursework while employed full-time in a position requiring an administrative credential.
4. Receive a passing score on the California Basic Educational Skills Test (CBEST).
5. Pass the competency exit review.

Counseling

Pupil Personnel Services Credential — Counseling

The Pupil Personnel Services Credential is required to function as a counselor in a public school setting, grades kindergarten through 12.

Admission Deadlines. Students seeking summer or fall enrollment must complete all admission requirements by March 1. Students seeking spring enrollment must complete all admission requirements by October 1.

Admission Requirements. Applicants for the Pupil Personnel Services Credential must complete the admissions packet as specified in the *General Admission Requirements* in the *Educa-*

tion — Graduate Program section. In addition to these requirements, applicants must:

1. Include the following with the admissions packet:
   a. Verification of attendance at a counselor education program orientation.
   b. Verification of having completed the Sixteen Personality Factor Questionnaire (16 PF) with provision to forward scores to the School of Education and Human Development.
   c. Evidence of having passed the California Basic Educational Skills Test (CBEST).
   d. A current medical clearance.
   e. A valid Certificate of Clearance to participate in public school field placement activities.
2. Complete prerequisite coursework in Introduction to Counseling (A S 174 or equivalent).
3. Receive approval through a review by a program faculty committee. Following receipt of the completed packet and the review by program faculty, applicants will receive written notification regarding admission status.

Program Requirements. Candidates for the Pupil Personnel Services Credential who have been approved by the Program Faculty Review Committee for admission to the program and who want to be recommended for the credential must meet the following program requirements:

1. Completion of A S 172, 221, 222, 224, 226, 227, 230, 231, 237A, 237B; Psych 155.
2. Completion of practicum and field work with a grade of *B* or better.
3. Pass the competency exit review.

Note: Students may not enroll in 200-level courses until their application has been approved by the Program Faculty Review Committee and they have been admitted to the credential program.

Pupil Personnel Services Credential — School Psychologist. See *Psychology Department.*

Special Education

Special Education Specialist Credential

The Special Education Credential Program offers preparation for teaching in areas of learning handicapped and severely handicapped.

An emphasis in Career/Vocational Education is available to all special education credential candidates; see the coordinator of special education for details.

All individuals making application for a Special Education Specialist Credential are also required to concurrently make application for the Master of Arts degree in Special Education.

Admission Requirements. Applicants for a Special Education Specialist Credential must meet the following requirements for admission to the program:

1. Complete application for postbaccalaureate standing at CSU, Fresno.
2. Complete application for admission to a School of Education and Human Development graduate program.
3. Possess an undergraduate GPA of 2.75+ (overall or on the last 60 units).
4. Complete a statement of purpose.
5. Obtain three letters of recommendation.
6. Complete prerequisites including: A S 111, 115F (1 unit), 170 for Learning Handicapped program applicants only *or* 171 for Severely Handicapped program applicants only, and A S 153.
7. Arrange for an interview with the program coordinator to: a) develop an approved program and b) be assigned an adviser.
8. Provide evidence of having passed the California Basic Educational Skills Test (CBEST).
9. Receive approval through a review by a program faculty committee.

Program Requirements. Candidates for the Special Education Specialist Credential who have been admitted to the program and who want to be recommended for authorization must meet the following requirements:

1. Completion of a basic teaching credential.
2. Permission of the special education faculty prior to enrollment in 200-level courses.
3. Completion of required courses for the desired area of specialization:
   a. *Learning Handicapped* (learning disabled, behaviorally disturbed and educable mentally retarded): A S 230, 242, 243, 245, 246, 248, 253, 256.
   b. *Severely Handicapped* (severely mentally retarded, severely emotionally disturbed or autistic, and multiple handicapped): A S 230, 242, 250A, 250B, 251A, 251B, 253, 254, 255.
4. Completion of practicum and field work with a grade of *B* or better.
5. Pass the competency exit review.

Notes:

1. Individuals must possess a minimum graduate GPA of 3.0 prior to enrollment in A S 255 or 256.
2. Individuals wishing to enroll in field work or supervision courses — A S 115F (when not taken the same semester as A S 111), 190, 249, 250B, 251B, 255, 256, 290, 298C — must contact and receive permission from the coordinator of special education the semester prior to enrolling in the course.

Graduate Programs

The Department of Advanced Studies offers programs leading to a Master of Arts degree in Education with options in administration and supervision, and school counseling; a Master of Arts degree in Special Education and a Master of Science degree in Counseling. Candidates who qualify for a preliminary teaching credential with completion of a bachelor's degree program may, with prior approval, use a master's degree program to satisfy the fifth-year requirements for a clear teaching credential.

Master of Arts Degree in Education, Option in Administration and Supervison

The Master of Arts degree program in educational administration and supervision is designed to provide professional preparation for the positions of principal, consultant, supervisor, program director, assistant superintendent and superintendent.

Admission Requirements for Classified Standing. See *General Admission Requirements* in the *Education — Graduate Program* section of this catalog.

Program Prerequisites. Fifteen units in Education including A S 153; an adequate background for advanced work in the field.

Course Requirements	Units
A S 220, 285 or 288, 298B or 299	10
Select 15 units from A S 261, 262, 263, 264, 265, 266	15
Electives: A S 267, 268, 272 or other approved electives.	5
Total	30

Master of Arts Degree in Education, Option in School counseling

The Master of Arts degree in Education with an option in school counseling is designed for individuals seeking advanced preparation for careers within educational settings.

Admission Requirements for Classified Standing. See *General Admission Requirements* in the *Education — Graduate Program* section of this catalog.

Admission Deadlines. Students seeking classified standing (full admission) for summer or fall enrollment must complete all admission requirements by March 1. Students seeking classified standing for spring must complete all admission requirements by October 1.

Admission Requirements. Applicants for admission to the Master of Arts degree in Education with an option in school counseling must complete the admissions packet as specified in the *General Admission Requirements* in the *Education — Graduate Program* section. In addition to these requirements, applicants must:

1. Include the following with the admissions packet:
   a. Verification of attendance at a counselor education program orientation.
   b. Verification of having completed the Sixteen Personality Factor Questionnaire (16 PF) with provision to forward scores to the School of Education and Human Development.
2. Complete prerequisite coursework in Introduction to Counseling (A S 174 or equivalent).
3. Receive approval through a review by program faculty committee. Following receipt of the completed packet and the review by program faculty, applicants will receive written notification regarding admission status.

Note: Students may not enroll in 200-level courses until their application has been approved by the review committee and they are admitted to classified standing (fully admitted to the program).

Course Requirements	Units
A S 220, 285 or 288, 298A or 299	10
A S 172, 224, 226, 237A or 237B or 238; Psych 155	15–16
Electives: A S 185T, 221, 222, 227, 228, 230, 231, 281T, 289, 290, or other approved electives	4–5
Total	30

Note: Practicum and field work experience must be completed with a grade of *B* or better.

Master of Science Degree in Counseling

The Master of Science in Counseling is a 60-unit professional degree program designed for persons who desire to practice in the field of counseling. Options are available in: 1) career development counseling and 2) marriage, family and child counseling. Persons completing this degree may qualify to work in agencies, community colleges, four-year colleges and universities, career development settings, marriage and family counseling, and related areas. Completion of the M.S. in Counseling with an option in marriage, family and child counseling fulfills the educational requirements for the State of California Marriage, Family and Child Counselor License if students take an elective upper-division or graduate level course (at least 2 units) in substance abuse and obtain at least 7 clock hours of training through either a university course or a noncredit professional development workshop (with appropriate verification of attendance) in child abuse assessment and reporting. Students seeking licensure should contact the coordinator of counselor education for information regarding licensing.

Admission Requirements for Classified Standing. See above — requirements same as for M.A. in Education, option in school counseling.

Course Requirements. Under the direction of a graduate adviser, each student selects an option in career development counseling, or marriage, family and child counseling, and develops and submits an individually designed program within the following framework:

	Units
Core requirements.	29
A S 220, 298A or 299	(7)
A S 118, 221, 224, 227, 228, 231; Psych 155	(22)
Option	19–22
Career Development Counseling	
A S 222, 229, 232, 235, 238 (6 units)	(19)
Marriage, Family and Child Counseling	
A S 223, 229, 233, 236, 238 (6 units); S Wrk 271T	(22)
Electives	9–12
Select from A S 111, 172, 185T, 222, 223, 225, 226, 229, 230, 232, 233, 234, 235, 236, 237A, 237B, 253, 280T, 281T, 285, 288, 289, 290; Crim 139, 141, 220, 221, 281; H S 110, 111, 124; CLS 180T; Psych 103, 132, 154, 166, 167, 169, 175, 178; S Wrk 122T, 129, 224, 226, 227, 271T; and other approved courses by the coordinator of counselor education.	
Total	60

Note: Practicum and field work experience must be completed with a grade of *B* or better.

Master of Arts Degree in Special Education

The Master of Arts degree program in Special Education offers specializations in learning handicapped and severely handicapped for those interested in professional work with exceptional individuals.

Admission Requirements for Classified Standing. See *General Admission Requirements* in the *Education — Graduate Program* section of this catalog.

Program Prerequisites. A S 111, 115F (1 unit), 153, 170 or 171; statement of purpose; interview with program coordinator; faculty review.

Course Requirements	Units
A S 220 and 298C or 299	7
Area of specialization, required courses	15
Learning Handicapped: A S 230, 242, 245, 253	(15)
Severely Handicapped: A S 250A, 250B, 251A, 251B, 254	(15)
Approved Electives	8
Select from A S 115F, 243, 244, 245, 246, 248, 249, 250A, 250B, 251A, 251B, 253, 254, 255, 256, 280T, 285, 288, 289, 290.	
Total	30

COURSES

Note: Students must provide their own transportation to off-campus sites for student teaching, field work, and observation and defray any resulting personal expense.

Advanced Studies (A S)

100. Career/Life Planning (3). An examination of the career development process with an emphasis on assisting students to explore their interests through self-assessment, career exploration and development of techniques for placement readiness. (Course fee for assessment materials, approximately $5–$10) *CR/NC* grading only.

111. Mainstreaming Exceptional Students (2). Prerequisite: T Ed 130 or 152 and T Ed 110 or 155A; or permission of instructor. Introduction to identification of differentiating characteristics in exceptional students. Comprehensive review and analysis of contemporary practices in mainstreaming exceptional pupils. Introduction to federal and state legislative mandates pertinent to nondiscriminatory assessments, parental involvement and individualized education plans (IEPs).

115F. Field Work in Special Education (1–3; max total 12). Prerequisite: permission of instructor. Supervised observation and participation in selected programs for exceptional children; educational planning, guidance and counseling.

118. Counseling and Mental Health (3). Examination of the relationship between counseling and mental health with emphasis on current issues of adjustment in society. Explores psychopathology within the framework of the DSM-III.

153. Educational Statistics (3). Prerequisite: ELM exam. Methods of describing, analyzing and interpreting data; statistical inference, including "t" test, correlation and prediction, chi square, and simple research design. Computer applications during lab activities. (2 seminar, 2 lab hours)

170. Introduction to Teaching Learning Handicapped Students (4). Prerequisite: A S 111 or equivalent. Introduction to theories, programs and methods of educating students with learning handicaps. (2 lecture, 4 lab hours)

171. Introduction To Teaching Severely Handicapped Students (4). Prerequisite: A S 111. Introduction to individual characteristics, curriculum issues and strategies applicable to the education of children with severe handicaps. (2 lecture, 4 lab hours)

172. Laws Relating to Children (3). Current and proposed legislation in parent-child relationships, adoption, and guardianship, education of the minor, marriage contract, child labor, juvenile delinquency, and child welfare programs.

174. Introduction to Counseling (3). (Same as Psych 174.) An overview of basic counseling models, including psychoanalytic, behavioral, cognitive and humanistic approaches. Includes a personal counseling experience.

185T. Topics in Counseling (1–3; 12 if no area repeated). Prerequisite: permission of instructor. Seminar covering special topics relating to counseling: new developments in counseling techniques, special populations and current research.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.*)

220. Research in Education (3). Prerequisite: 12 units of education courses or equivalent and A S 153. Seminar in research methodology; identification of educational research problems; use of library resources, data gathering and processing, writing a research report; applies to elementary and secondary teaching, early childhood, reading, administration, counseling, special education and related fields. (2 seminar, 2 lab hours)

221. Seminar in Multicultural Aspects of Counseling (3). Prerequisite: A S 174 or R C 201. Cognitive and experiential study of social and psychological variables which influence the cross-cultural counseling relationship. Culturally relevant models of counseling theory and practice are explored. Current research methods and findings are presented. (2 seminar, 2 lab hours)

222. Seminar in Career Development Theory (3). Prerequisite: A S 174. Examination of career development theories and research for their implications in understanding career development generally and career counseling specifically. (Course fee for assessment materials, approximately $5–$10) (2 seminar, 2 lab hours)

223. Seminar in Theories of Marriage, Family and Child Counseling (3). Prerequisite: A S 174. Study of theories, techniques and methodology of counseling with families. Current research and methods are presented. (2 seminar, 2 lab hours)

224. Seminar in Counseling Techniques (3). Prerequisite: A S 174 or R C 201. Emphasis given to interviewing skills, philosophy, theory and methodology as applied to counseling. (2 seminar, 2 lab hours)

225. Seminar in Advanced Theories and Techniques in Counseling (3). Prerequisite: A S 224. Emphasis on philosophy, theory and methodology as applied to Gestalt and behavioral approaches to counseling. (2 seminar, 2 lab hours)

226. Seminar in Organization of Counseling Services (3). Prerequisite: A S 224. Organization, administration and evaluation of counseling programs. (2 seminar, 2 lab hours)

227. Seminar in Assessment in Counseling (3). Prerequisite: A S 153. Selection, administration, and evaluation of psychological tests and psychometric data for use in counseling settings. (Course fee for assessment materials, approximately $5 to $10) (2 seminar, 2 lab hours)

228. Seminar in Group Process (3). Prerequisite: A S 174 or R C 201. Theories and methods of interpersonal communication within groups, transferral of information, group leadership and membership, role perceptions, verbal and non-verbal interaction and group counseling. (2 seminar, 2 lab hours)

229. Seminar in Counseling the Older Adult (3). Prerequisite: A S 224. Study of counseling philosophy, theory, methodology and skills applicable to problems of the older adult. (2 seminar, 2 lab hours)

230. Seminar in Counseling of Exceptional Children and Their Parents (3). Theories and techniques in working with parents of exceptional children; emphasis placed on individual and group counseling skills with parents; direct contact with families, case study and current legislation. (2 seminar, 2 lab hours)

231. Practicum in Counseling (4; max total 8). Prerequisite: 12 units in counseling program, including A S 224. Supervised on-campus counseling experiences with selected clients. Experience in individual counseling, critiquing of tapes and typescripts, observations, and case report writing. Students must carry professional liability insurance. (2 seminar, 4 lab hours)

232. Seminar in Career Counseling: Methods and Materials (3). Prerequisite: A S 174, 222. Develop knowledge and skills necessary to facilitate career assessment, decision-making, and job-seeking activities of students and other clientele. (Course fee for assessment materials, approximately $5 to $10) (2 seminar, 2 lab hours)

233. Practicum in Marriage, Family and Child Counseling (4; max total 8). Prerequisite: A S 223, 231, 236 and permission of instructor. Supervised MFCC counseling experiences involving selected families, couples and/or children. Students must carry professional liability insurance.

234. Practicum in Group Counseling (4; max total 8). Prerequisite: A S 228, 231 and permission of instructor. Supervised on-campus group counseling experience with selected small groups. Experience in group leadership and group counseling. (2 seminar, 4 lab hours)

235. Practicum in Career Development Counseling (4; max total 8). Prerequisite: A S 222, 231 and permission of instructor. Supervised counseling experiences in vocational career development.

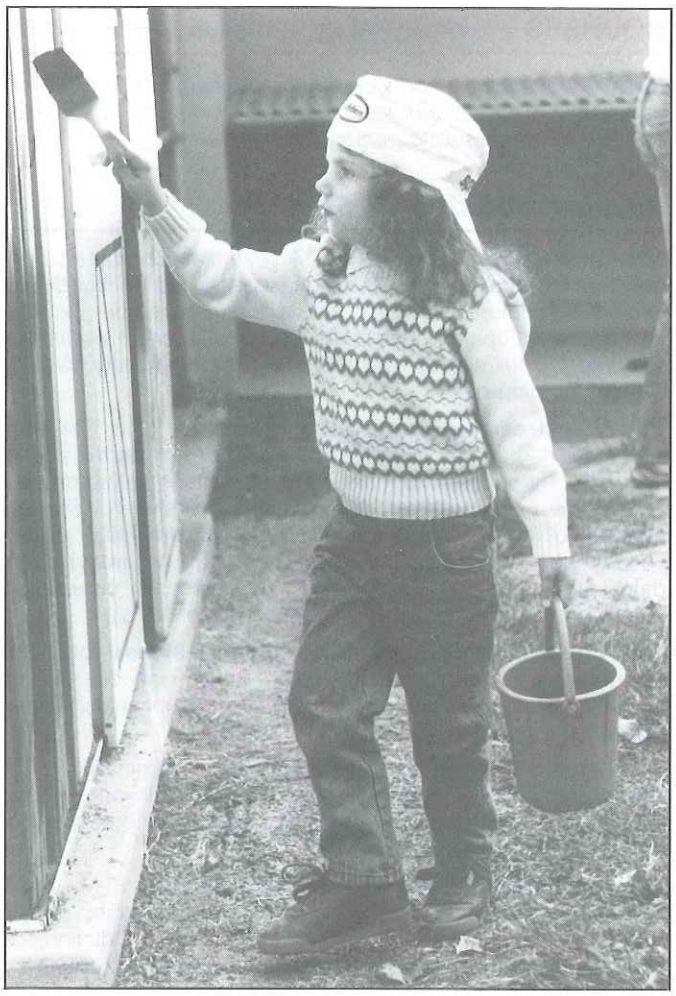
236. Seminar in Professional Practices of Family Counseling (3). Prerequisite: A S 223, 224 and permission of instructor. Analysis of separation, divorce and relation dissolution, family law and legal issues in practice diagnosis of client and family disorders; family practice and third party payments. (2 seminar, 2 lab hours)

237A. Field Work in Elementary School Counseling (4–8; max total 12). Prerequisite: A S 224 and permission of instructor. Supervised practice in an elementary school. Students must carry professional liability insurance. Approved for *SP* grading. (160 hours of work required for 4 units of credit)

237B. Field Work in Secondary School Counseling (4–8; max total 12). Prerequisite: A S 224 and permission of instructor. Supervised practice in secondary school. Students must carry professional liability insurance. Approved for *SP* grading. (160 hours of field work required for 4 units of credit) (Former A S 224FA)

238. Field Work in Professional Services Counseling (3–12; max total 12). Prerequisite: 40 units in counseling program, including A S 224 and 231. Designed for students wishing to do field work in professional counseling services, including, but not limited to, agencies, colleges, and universities, supervised placement. Typically requires a one-year commitment. Students must carry professional liability insurance. Approved for *SP* grading. (150 hours of field work required for 3 units of credit) (Former A S 224FC)

242. Seminar in Behavior Management (4). Prerequisite: A S 111 or equivalent. Behavior management principles, effective discipline, programs and techniques employed in special education and clinical prescriptive teaching. Emphasis on school and home applications. (2 seminar, 4 lab hours)



243. Motor, Sensory, and Perceptual Abilities (4). Prerequisite: A S 111 or equivalent. Seminar in the special education of persons who are learning handicapped with psychomotor disabilities, neuropsychological disabilities such as hyperkinesis, visual or auditory deficits, and dyslexia. Diagnostic-prescriptive programming and critiques required. (2 seminar, 4 lab hours)

244. Organization and Supervision of Special Education (3). Prerequisite: A S 111 or permission of instructor. Seminar in the organization, financing, housing, equipping, staffing, and supervision of the special education program; desirable educational provisions for each type of exceptionality; legal provisions for special education including curriculum development, in-service education and teacher-pupil relationships.

245. Assessment of Learning Handicapped Students (4). Prerequisite: A S 111, 153, 170. Review of testing techniques and instruments, and development of psychoeducational reports. Extensive independent child study and evaluation with appropriate diagnostic instruments. (Course fee for test materials, approximately $5 to $10) (2 seminar, 4 lab hours)

246. Seminar in Curriculum for Learning Handicapped Students (4). Prerequisite: A S 111, 170, 243, 245. Advanced curriculum development for learning handicapped with language and cognitive disabilities. Diagnostic-prescriptive programming required. (2 seminar, 4 lab hours)

248. Social and Affective Education (3). Prerequisite: A S 111 or equivalent. Seminar. Development and remediation of social skills and affective abilities. Model programs for normal children and prescriptive interventions for those with social and personal behavior disorders. (2 seminar, 2 lab hours)

249. Practicum/Clinic: Career Education for the Handicapped (3–9; max total 9). Prerequisite: A S 253 and permission of instructor. Clinical experience in private and public agencies involved with vocational/career training for the handicapped work evaluation and job training programs supervised by university personnel. (2 lab hours and 1 hour outside preparation per unit)

250A. Assessment of Severely Handicapped Students (3). Prerequisite: A S 111, 171. Presentation of assessment strategies and methods used to identify severely handicapped students' current levels of educational performance across school and community-based curriculum domains. Emphasis is upon assessment practices which contribute data to the design of appropriate individualized education plans. (2 seminar, 2 lab hours)

250B. Practicum in Assessment of Severely Handicapped Students (3). Prerequisite: A S 111, 171. Concurrent enrollment in A S 250A required. Supervised, field-based experience in educational assessment strategies used to plan individualized instructional programs and services.

251A. Instructional Methods for Severely Handicapped Students (3). Prerequisite: A S 111, 171, 250A, 250B. Presentation of instructional approaches, methods and techniques for teaching school and community-based curriculum content. Emphasis is upon educational practices which contribute to the design, implementation and evaluation of appropriate individualized education programs and services. (2 seminar, 2 lab hours)

251B. Practicum in Instruction of Severely Handicapped Students (3). Prerequisite: A S 111, 171, 250A, 250B. Concurrent enrollment in 251A required. Supervised, field-based experience in instructional methods and strategies used to implement and evaluate individualized educational programs.

253. Career Education for Handicapped Students (4). Prerequisite: A S 111 or permission of instructor. Seminar in the examination of career education; models, curriculum scope and sequence, transitional approaches to independent living, and the utilization of local, state, and federal resources. (Test materials fee, approximately $5–$10) (2 seminar, 4 lab hours)

254. Seminar in Special Education for Severely Handicapped Students (3). Prerequisite: A S 111, 171; prior or concurrent enrollment in 250A and 250B or 251A and 251B. Analysis of contemporary educational practices, policies and issues effecting the organization and provision of appropriate programs and related services for severely handicapped students from preschool through young adulthood. Review of selected research literature.

255. Advanced Practicum in Special Education for Severely Handicapped Students (4). Prerequisite: A S 111, 153, 171; A S 250A, 250B, 251A, 251B; prior or concurrent enrollment in A S 230, 242, 253. Supervised, field-based experience in advanced teaching methods and procedures for integrating required competencies in the areas of program organization, management of teaching environments, skill assessment and instructional planning, behavior management, IEP implementation, program evaluation, teacher and parent consultation, microtechnology and continuing professional development.

256. Practicum in Special Education: Learning Handicapped (5). Prerequisite: A S 111, 115F, 153, 170, 243, 245; prior and/or simultaneous enrollment in a maximum of 12 units in the following courses: A S 230, 242, 246, 248, 253. Clinical experience in diagnosis and evaluation of the learning handicapped, prescriptive program development, prescriptive instruction, and program management. Experience to include data gathering, program planning and execution, evaluation, and consultation.

261. Organization for Administration and Support of Education (3). Prerequisite: teaching experience. Interrelationships of federal, state, county, city, and district units in the administration and promotion of programs of education.

262. Seminar in Educational Leadership (3). Prerequisite: teaching experience; A S 261. Seminar on problems, procedures, and organizational relationships of elementary and secondary schools; the administrator's responsibilities in areas of organization and control; teacher personnel, pupil personnel, noncertificated personnel; special and auxiliary agencies; guidance; supervision; community relationships.

263. Seminar in Supervision for Improvement of Instruction (3). Prerequisite: teaching experience; T Ed 250 or 273; A S 261. Seminar for clarification and application of modern concepts and techniques of supervision; practice in leadership roles, promoting productive human relationships, developing communication skills, and evaluation of teaching; ways of helping teachers in their credential fields.

264. Seminar in the Legal Aspects of Education (3). Prerequisite: teaching experience; A S 261. A case study approach in reviewing important court decisions, both state and federal, that have directly affected the public schools. Legal relationships in public education applied to federal, state, and local levels.

265. Seminar in School-Community Relations (3). Prerequisite: A S 261. Seminar on interaction with community forces, news media, political agencies, and minority groups in policy development; decision-making based on factual data. (Former A S 276)

266. Seminar in School Finance and Business Administration (3). Prerequisite: A S 261. Economic perspectives and practices of school finance and business administration; local, state, and federal responsibility for financial support of education. (2 seminar, 2 lab hours)

267. Field Work in Administrative Services — Elementary School (3). Prerequisite: 9 units selected from: A S 261, 262, 263, 264, 266, 272, 275. Supervised administrative practice in an elementary school. Includes seminar discussions of field experiences and required research (120 hours required for 3 units credit) (Former A S 273A)

268. Field Work in Administrative Services — Secondary School (3). Prerequisite: 9 units selected from A S 261, 262, 263, 264, 266, 272, 275. Supervised administrative practice in a secondary school. Includes seminar discussions of field experiences and required research. (120 hours required for 3 units of credit) (Former A S 273B)

271. Seminar in School Facilities (3). Prerequisite: preliminary credential or permission of instructor. Emphasis on planning, design and function of educational facilities so they are consistent with the educational goals of the school and school district. (2 seminar, 2 lab hours)

272. Seminar in Advanced Curriculum Evaluation and Development (3). Prerequisite: preliminary credential or permission of instructor. Nature and scope of curriculum development; administrative determiners of curriculum; influence of governmental agencies and organizations, foundations, business and industry, and power structures as curriculum determiners; international influence on curriculum development and curriculum evaluation at various levels of governmental operation.

273. Ethical and Professional Issues in Education Administration (3). Prerequisite: Preliminary Administrative Services Credential or permission of the instructor. Seminar on the ethical and professional issues of administrative professionalism, examined in the context of the various roles the administrator is expected to perform as a practitioner.

274. Advanced School Finance and Business Services (3). Prerequisite: preliminary credential or permission of instructor. Primary emphasis is directed toward the acquisition of expertise in advanced planning and management of business and finance elements of public schools. (2 seminar, 2 lab hours)

275. Seminar in Advanced Techniques of Personnel Administration in Education (3). Prerequisite: preliminary credential or permission of instructor. Advanced techniques of staff improvement inservice, staff participation in policy making, improvement of communication channels and methods of communication, economic and contractual relationships, and improvement of working conditions; work and responsibility of nonteaching staff members.

277. Computer Applications in Educational Administration (3). Prerequisite: preliminary credential or permission of instructor. Factors relating to assessment and implementation of computer applications to support educational programs and administrative operations in school districts, including: computer assisted instruction, student personnel, fiscal and property controls, personnel and related educational and business functions characteristic of school districts. (2 seminar, 2 lab hours)

278T. Topics in Advanced Educational Administration (1–3). Prerequisite: preliminary credential or permission of instructor. Seminar covering special topics relating to educational administration: new developments in educational administration, special populations, and current research.

279. Advanced Administration Field Work (2–8; max total 8). Prerequisite: employment in a position requiring an Administrative Services Credential and permission of instructor. Supervision of Professional Administrative Services Credential candidates in their place of employment. The type of assignment will depend on requirements of the university and will be individually developed in cooperation with candidate's employer. Includes seminar discussions of field experience and required research. (80 hours required for 2 units)

280T. Advanced Topics in Special Education (1–3; 12 if no area is repeated. Prerequisite: postbaccalaureate standing and permission of instructor. Topics may include: special education legislation, parenting, transitional programming, parents as teachers, adolescents and adults with disabilities, current research, child abuse, gifted and talented.

281T. Advanced Topics in Counseling (1–3; 12 if no area is repeated). Prerequisite: postbaccalaureate standing and permission of instructor. Topics may include: new developments in counseling techniques, special populations and current research.

285. Seminar in Advanced Educational Psychology (3). Prerequisite: minimum 3 units from the following: T Ed 130, 152; A S 174, or Psych 101. Seminar on the psychological foundations of education; nature and characteristics of development, learning processes, and forces which affect educational growth.

288. Educational Measurement and Program Evaluation (3). Prerequisite: A S 153. Procedures and issues involved in the measurement and evaluation of educational programs; planning, etc. Applications in educational settings are emphasized. (2 seminar, 2 lab hours)

289. Seminar in Advanced Educational Research (3). Prerequisite: A S 153 and 220; or permission of instructor. Emphasis on conceptualizing advanced educational research problems, analyzing data and interpreting data, computer lab activities using such techniques as ANOVA, multiple regression, and multivariate statistics and developing the methodology for thesis proposals. (2 seminar, 2 lab hours)

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

298A. Project — Counseling (4). (See *Criteria for Thesis and Project.*) Prerequisite: advancement to candidacy for the master's degree; *B* average on 24 units of the master's program including A S 220. A project consists of a significant undertaking appropriate to counseling such as the development of a program for counseling service delivery, development of audio-visual materials or computer software for counselor education or service delivery. An approved proposal is required for enrollment. Approved for *SP* grading.

298B. Project — Education (4). (See *Criteria for Thesis and Project.*) Prerequisite: advancement to candidacy for the master's degree; *B* average on 24 units of the master's program including A S 220. A project consists of a significant undertaking appropriate to education such as the development of curricula and instructional materials, studies of school law, finance, community relations, personnel, educational policy, and educational theory. An approved proposal is required for enrollment. Approved for *SP* grading.

298C. Project — Special Education (4). (See *Criteria for Thesis and Project.*) Prerequisite: advancement to candidacy for the master's degree; *B* average on 24 units of the master's program including A S 220. A project consists of a significant undertaking appropriate to special education such as the development of courses of study, instructional manuals, teachers guides, intervention programs, and computer software. An approved proposal is required for enrollment. Approved for *SP* grading.

299. Thesis (4). (See *Criteria for Thesis and Project.*) Prerequisite: Advancement to candidacy for the master's degree, *B* average on 24 units of the master's program including A S 220 and completion of an acceptable thesis proposal. Preparation, completion, and submission of an acceptable thesis for the master's degree. See School of Education and Human Development's Graduate Programs Coordinator for school thesis guidelines. Approved for *SP* grading.

IN-SERVICE COURSE *(A S)*

(See *Course Numbering System.*)

373. Instructional and Curriculum Problems and Practices (1–3; max total 12 if no topic repeated). Various topics related to public school instruction problems, special services, supervision and administration. Not applicable on degree programs.

EDUCATION
Interdepartmental Programs and Courses

School of Education and Human Development
Barbara G. Burch, Dean
Ed/Psych Building, Room 133
(209) 278-2623

Robert H. Monke, Associate Dean
Ed/Psych Building, Room 120
(209) 278-3084

Courses with a prefix "Education and Human Development" (EHD) are unique in that they have the following characteristics: educational emphasis is broader in definition with a focus outside of the traditional K–12 setting; educational emphasis is placed on the entire lifespan ranging from infants to the elderly; and educational emphasis is directed toward development and enhancement of the total human being.

Interdepartmental courses are applicable to a variety of student interests and needs. They are taken by students pursuing credentials and degrees within the field of education and human development, as well as by students seeking credentials and degrees in other schools.

EHD courses have appeal to students from other disciplines and may be taken both by educators and non-educators. Furthermore, some EHD courses are taught in cooperation with other disciplines at CSU, Fresno and these course clusters can lead to special certificates.

Victims Services Certificate of Special Study

The School of Education and Human Development (SOEHD) and the Department of Criminology are cooperatively sponsoring the Victim Services Certificate of Special Study Program.

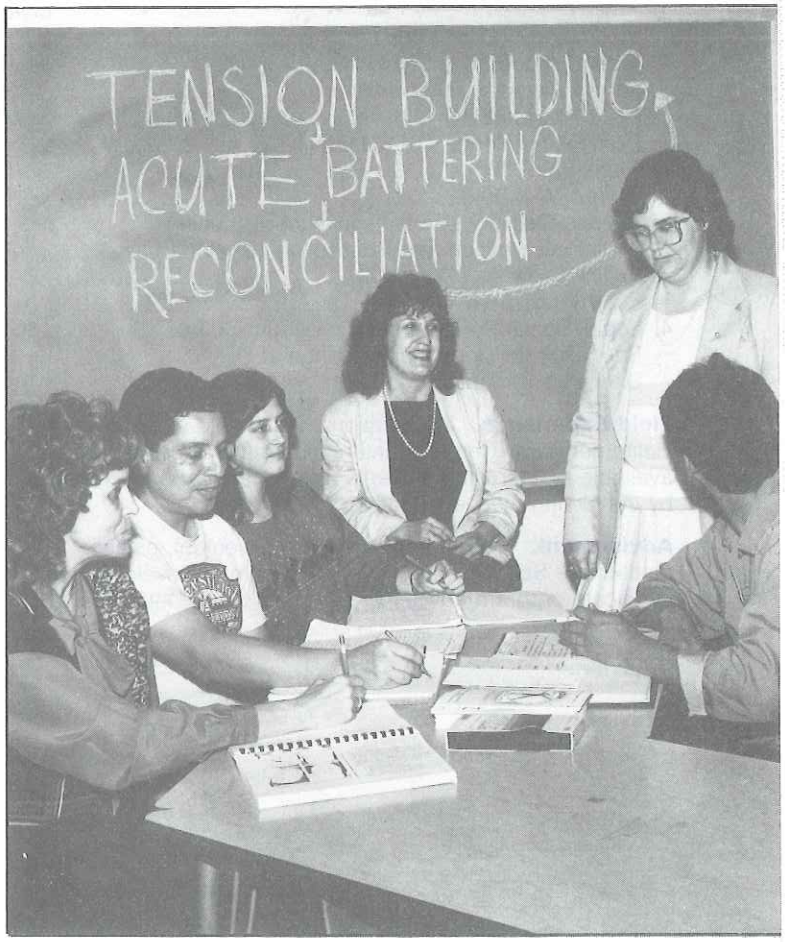
The primary goal of the Victim Services Program is to provide appropriate educational experiences needed for acquiring knowledge and skills for working with victims within a criminological/human development framework. The content of the program is also very useful for individuals interested in pursuing a career in the area of behavioral sciences.

Students working toward a Victim Services Certificate of Special Study have an opportunity to receive an interdisciplinary/interagency examination of victim services as they relate to: theoretical concepts, legal aspects, victim rights, causes of victimization and services available to assist the victim. Furthermore, emphasis is directed toward assisting the students in acquiring new perspectives and skills needed for working effectively with different types of victims.

Program Processes and Procedures. To attain a Victim Services Certificate, the candidate must progress through three distinct program phases: admission, completion of program courses and certificate authorization. Each of these program phases is described below:

Admission. The following admission requirements (Items 1–3) must be met and the documentation returned to the SOEHD admissions/records office (EdP 120) *in one complete packet:*

1. Verification of enrollment at CSUF (letter of acceptance, grade slip from previous semester, preregistration letter or extension students identification card).
2. Completion of the "Victim Services Certificate Program Application" including required signatures.
3. A set of transcripts verifying completion of prior college/university coursework. These transcripts are needed to verify:
   a. Attainment of upper-division status (completion of 60 or more undergraduate units).
   b. Completion of at least one general course in psychology, sociology, anthropology, health science, or child and family studies.



Completion of Program Courses:

1. Complete all approved courses that were identified on the Victim Service Program Application form.
2. Complete the "Application for the Victim Services Certificate" form obtained in EdP 120.

Certificate Authorization:

1. The SOEHD credential analyst verifies that all coursework has been completed.
2. The certificate is signed and awarded.

Course Requirements. A minimum of 12 units are required with 3 units selected from each of the four emphasis areas: 1) theory, 2) victim issues, 3) service delivery and 4) legal/social policy.

	Units
1. Theory	
Victimology (Crim 175)	3
2. Victim Issues (Select minimum of 3 units)	
Family Violence (Crim 140)	3
Child Abuse (EHD 107)	3
Domestic Violence (W S 116)	1
Rape (W S 108)	1
Incest (W S 109)	1
3. Service Delivery (Select minimum of 3 units)	
Victim Intervention and Counseling (EHD 108)	3
Victim Services (Crim 176)	3
Child Welfare (S Wrk 128)	3
4. Legal/Social Policy (Select minimum of 3 units)	
Education for Community Change (EHD 109)	3
Social Movements (Soc 122)	3

Field Experience. An additional 3-unit field experience in victim services (Crim 181: Internship in Corrections) is available to interested students. Enrollment can be arranged by contacting the Department of Criminology.

Advisement. For information and advisement, please contact the School of Education and Human Development certificate program adviser or the chair of the Department of Criminology.

COURSES

Education and Human Development (EHD)

101. Peace Education (1–3). An introduction to peaceful conflict resolution strategies for use in the home, school, community and international relations including educational models and programs for the prevention of nuclear war. A multidisciplinary approach with invited speakers and audiovisual presentations.

107. Child Abuse (3). Develops perspectives on child abuse and child victimization. Assessment, treatment and prevention of child abuse/neglect are covered. Other areas include: effects of divorce, media, and war on the lives of children and children's rights. Course meets licensure and licensure renewal requirements for many professional groups. (Former Educ 180T section)

108. Victim Intervention and Counseling (3). Focuses on the coping process and on both the immediate and residual effects of victimization. It also looks at ways of counseling direct and indirect victims (families and friends of victims): hot lines, warm lines, stress reduction, support groups, short and long-term counseling.

109. Education for Community Change (3). The capacity of a society to ensure individuals a safe environment and a high quality of life is dependent on its ability to respond to needs and make appropriate changes. Examples of specific mechanisms for effecting public policy is explored. The course includes such activities as advocacy, planning strategies, legislative proposals, grant writing, grass roots organizing and public education efforts at the city, county and state levels.

EDUCATION
Teacher Education

School of Education and Human Development
Department of Teacher Education
Bernice Bass de Martinez, Chair
Ed/Psych Building, Room 125
(209) 278-2316

M.A. in Education
Options:
Curriculum and Instruction
Early Childhood Education
Reading

Credentials:
Multiple Subject
Single Subject
Early Childhood Specialist
Reading Specialist
Language Development Specialist Certificate

The primary mission of the Department of Teacher Education is to prepare knowledgeable and professionally competent teachers for employment in public and private educational settings. Program focus ranges from working with preschool children to young adults at the senior high school level. Programs offered by the Department of Teacher Education are identified within two major categories: teaching credential programs and master's degree programs.

Credential Programs

Basic Teaching Credentials. A basic teaching credential may be earned in conjunction with a baccalaureate degree (preliminary credential) or following completion of a fifth year course of study (clear credential). The two basic teaching credentials are: 1) the Multiple Subject Credential and 2) the Single Subject Credential.

The *Multiple Subject Credential* holder is authorized to teach in self-contained classrooms from kindergarten through grade 12. Most holders of the Multiple Subject Credential teach in elementary school settings. Programs available include: 1) Multiple Subject Credential (General), 2) Multiple Subject Credential — Bilingual/Cross-Cultural Emphasis, and 3) Multiple Subject Credential — Early Childhood Education Emphasis.

The *Single Subject Credential* holder is authorized to teach in the subject area of the credential in departmentalized classrooms typically found in middle school and senior high school settings. This credential is offered in: Agriculture, Art, Business, English, English-Speech, English-Drama, English-ESL, Foreign Languages (French, German and Spanish), Health Science, Home Economics, Industrial Arts, Life Science, Mathematics, Music, Physical Education, Physical Science and Social Science.

Specialist Teaching Credentials. The specialist teaching credential represents a year of postbaccalaureate study in an area of teaching specialization. The specialist credential may be earned by a holder of a Multiple Subject Credential or a Single Subject Credential. The Department of Teacher Education offers specialist credentials in Early Childhood Education and Reading, as well as the Language Development Specialist Certificate. Specialist credentials also are available in Agriculture (see the *School of Agriculture*), Special Education — Learning Handicapped and Severely Handicapped (see the *Department of Advanced Studies*), and Special Education — Communication Handicapped (see the *Department of Communicative Disorders)*.

Master's Degree Programs

The Department of Teacher Education offers advanced and specialized study directed toward the attainment of the Master of Arts degree in Education. Completion of a master's degree signifies that the holder is prepared to provide professional leadership in an area of specialization. Most candidates for the master's degree have three or more years of successful teaching experience. The Master of Arts degree in Education is comprised of five different program options. Those offered through the Department of Teacher Education include: 1) Curriculum and Instruction, 2) Early Childhood Education and 3) Reading.

Those offered through the Department of Advanced Studies include: 1) Administration and 2) School Counseling.

Career Opportunities

CSU, Fresno is located in the center of a large urban/industrial and agricultural regional service area. This unique geographical position allows for ready access to large suburban school systems, as well as many less populated school districts in the predominantly rural Central Valley.



Recent statistical reports provide evidence that the area population is continuing to increase along with the number of school aged children. This pattern of growth along with anticipated attrition from the teaching profession provides considerable evidence of a growing demand for classroom teachers, curriculum specialists, and other positions directly or indirectly related to the field of education.

Faculty

Judith C. Neal, *Coordinator of Multiple Subject Credential program*
Office Phone: (209) 278-2631
Joan C. Henderson, *Coordinator of Multiple Subject Field Placement*
Office Phone: (209) 278-4446
Jolyne S. Daughtry, *Coordinator of Single Subject Credential program*
Office Phone: (209) 278-4445
Robert D. Segura, *Coordinator of Bilingual/Cross-Cultural Education Emphasis*
Office Phone: (209) 278-2765
Doris Smith, *Coordinator of Early Childhood Education Emphasis and Specialist Credential program*
Office Phone: (209) 278-2185
Bonnie L. Dutton, *Coordinator of Reading Specialist Credential program*
Office Phone: (209) 278-7007
Charlene K. Smith, *Multiple Subject Fifth Year Credential Adviser*
Office Phone: (209) 278-4381

Shareen Abramson
George E. Avery
Mario L. M. Baca
Bernice M. Bass de Martinez
Leonard H. Bathurst
Jacques S. Benninga
Kathryn J. Biacindo
Barbara G. Burch
Jolyne S. Daughtry
Bonnie L. Dutton
Penelope A. Dyer
Berta Gonzalez
Diane J. Harris
Susan B. Harris
Adrienne L. Herrell
Nancy P. Hunt
Margaret G. Kelly
Alexander H. Lark
Sandra J. LeSourd
David P. Lopez
Judith C. Neal
Arne J. Nixon
Cecilio Orozco
Richard F. Osterberg
Theresa R. Perez
Robert H. Pritchard
Lester J. Roth
Ivan H. Rowe
Robert D. Segura
Marilyn R. Shelton
Charlene K. Smith
Doris O. Smith
Bernice A. Stone
Carl R. Stutzman
David E. Tanner
Gail E. Tompkins
Atilano A. Valencia

Faculty and Facilities

The faculty represents a wide range of experience and specialization. Students are encouraged to meet frequently with their professors and advisers to discuss their progress and concerns. Individual attention is the concern of the faculty and support staff of the department.

Campus facilities that support credential and degree programs include the Henry Madden Library, including the Curriculum Library and Children's Literature Section, Educational Learning Laboratory, Reading Clinic and Computer Labs. Opportunities are also available for educational experiences with students and faculty from other majors through use of the CSU, Fresno Interdisciplinary Clinic.

Off-campus facilities include the elementary, middle and high schools in the university service area. The School of Education and Human Development maintains close working relationships with school districts that provide sites used for student teaching experiences for credential candidates. University supervisors work closely with cooperating teachers to assure high quality environments for student teachers.

Credential Programs

The teacher education department offers alternative state-approved programs leading to two basic credentials, the Multiple Subject Credential (primarily for prospective elementary school teachers) and the Single Subject Credential (primarily for prospective secondary school teachers). In addition to the general Multiple Subject Program, approved special emphasis credential programs leading to a Multiple Subject Credential currently include Bilingual/Cross-Cultural Education and Early Childhood Education.

State Admission Requirements

California Code of Regulations Section 41100 mandates that for admission to a teaching credential program, the student must be assessed in terms of the following criteria:

Scholarship. The candidate shall have earned at the college level a grade point average that falls within the upper 50 percent of undergraduate students in the candidate's discipline division on the campus.

Prerequisite Courses and Field Experiences. The candidate shall have successfully completed a supervised early field experience (T Ed 50), and other prerequisite courses and experiences prescribed by the campus.

Professional Aptitude. The candidate shall demonstrate suitable aptitude for teaching in the public schools. Aptitude is assessed through interviews, letters of recommendation and a written statement of professional goals or philosophy.

Physical Fitness. The candidate shall satisfy the standards of physical fitness required by the State Credentialing Agency.

Fundamental Skills. The candidate shall demonstrate proficiency in fundamental skills in written and spoken English, reading, and mathematics.

Personality and Character. The candidate shall demonstrate personality and character traits that satisfy the standards of the teaching profession.

Admission Exceptions. If a candidate has not met one or more admission requirements, but possesses compensating strengths in other required areas, he/she may be granted conditional admission which must be cleared prior to admission to student teaching. The number of exceptions granted each year shall not exceed 15 percent of the total number of candidates admitted during the previous year.

Multiple Subject Credential Programs

Holders of Multiple Subject Credentials are authorized to teach in self-contained classrooms commonly found in elementary schools. There are two types of Multiple Subject Credentials: the preliminary Multiple Subject Credential and the Clear Multiple Subject Credential (fifth year).

General Requirements for Initial Admission

(Preliminary Multiple Subject Credential)

1. Attend a Multiple Subject Credential program orientation meeting.
2. Provide evidence that you have successfully completed T Ed 50/Introduction to Teaching or submit an approved course waiver.

3. Show evidence of passing the California Basic Educational Skills Test (CBEST) by presenting a CBEST Permanent Verification Card.
4. Complete an application to the credential program.
5. Verify admission to CSU, Fresno with a student I.D. card or a Notice of Admission.
6. Provide a complete set of transcripts of all prior college/university coursework. Transcripts are used to verify a GPA that is in the top 50 percent of the applicant's major field of study or discipline.
7. Complete an Admission Interview Form and obtain interviews from two Multiple Subject Credential faculty members.
8. Obtain a medical clearance at the University Health Center.
9. Obtain two completed *Recommendation for Admission to Teacher Education* forms written by instructors, supervisors or other individuals in a position to recommend for admission into a teacher education program.
10. Obtain appropriate clearance to teach in a public school by presenting a valid California Teaching Credential or applying for a Certificate of Clearance.

Required application materials and forms are available in the School of Education and Human Development's Admissions and Records Office (EdP, Room 120). All admission requirements (forms, documents, prerequisites) must be completed prior to enrollment in professional program courses.

Timelines for initial admission to the Multiple Subject Credential program are listed below. Application forms are available in EdP, Room 120.

Semester Enrolled	*Application Requirements Completed*
Summer	April 1
Fall	April 1
Spring	November 1

Requirements for Admission to Student Teaching
(Preliminary Multiple Subject Credential)

Multiple Subject Credential candidates must qualify for admission to two distinct levels of student teaching: 1) Initial Student Teaching (T Ed 110) and 2) Final Student Teaching (T Ed 160A, B and C).

Requirements for Admission to Initial Student Teaching (T Ed 110)

1. Submit a T Ed 110 application form by deadline.
2. Complete all admissions requirements and receive notification of initial admission to the program.
3. Students will take T Ed 130/Psychological Foundations of Education (3 units), T Ed 140/Cultural Foundations of Education (3 units), T Ed 150/Curriculum and Instruction in Elementary School (3 units), and T Ed 156M/ Reading in the Elementary School (3 units) concurrently with Initial Student Teaching (T Ed 110). This is provided as a means to maximize the bridging of theory and practice. In certain circumstances because of work schedules and other obligations, students may take T Ed 130 and 140 prior to Initial Student Teaching. However, T Ed 150 and 156M must be taken concurrently with Initial Student Teaching (except Option II).

Timelines for admission to Initial Student Teaching (T Ed 110) are listed below. Application forms are available in EdP, Room 120.

Semester Enrolled	*Application Requirements Completed*
Fall	April 1
Spring	November 1

Requirements for Admission to Final Student Teaching (T Ed 160A, B and C*)

1. Submit a T Ed 160 application form by deadline.
2. Successfully complete Initial Student Teaching (T Ed 110).
3. Demonstrate subject matter competence by:
   a. Completing an approved Liberal Studies waiver program or pass the National Teacher Examination (NTE) Test of General Knowledge of the Core Battery.
   b. Receiving clearance from the program faculty that subject matter competency has been met.
4. Complete an approved program of professional preparation in a specific program option (See Program Option section) maintaining a GPA of 3.0.
5. Develop a fifth-year program and have it approved by the School of Education and Human Development fifth-year adviser.
6. If admitted as an exception with conditions, satisfy all conditions specified.

*7. Clarification: Students who elect to complete T Ed 160 in two semesters sign up for T Ed 160A (6 units) and T Ed 160B (6 units). T Ed 160B must include two weeks of full-time student teaching. T Ed 160C requires one full semester, all day, every day student teaching.

Timelines for Admission to Final Student Teaching (T Ed 160A, B, and C) are listed below. Application forms are available in EdP, Room 120.

Semester Enrolled	*Application Requirements Completed*
Fall	February 28
Spring	September 30

Program Options

Preliminary Multiple Subject Credential programs include: Option I, General or Bilingual/Cross-Cultural Emphasis; Option II, Early Childhood Education Emphasis; Option III, Communicative Disorders; and Option IV, Postbaccalaureate Block Program.

Option I: General. The Option I, General Multiple Subject Credential program is directed toward providing professional preparation required for teaching in self-contained educational settings (typically found in the elementary school).

Program Requirements

1. *Subject Matter Competency:* Demonstrate subject matter competence through completion of the Liberal Studies Waiver program *or* pass the NTE Test of General Knowledge and receive faculty certification of competence.

2. *Professional Preparation:* *Units*

T Ed 110	3
T Ed 121	3
T Ed 130	3
T Ed 140	3
T Ed 150	3
T Ed 156M	3
T Ed 160	12
Total	30

3. *Completion of Bachelor's Degree:* California law requires a bachelor's degree in a subject area other than professional education.

Option II: Early Childhood Education Emphasis. The Early Childhood Education Emphasis program prepares students to teach in the elementary grades, with special strengths in early childhood education. This block program with field work and student teaching in early childhood classrooms, preschool, kindergarten, primary and intermediate grades, enables the student to obtain a Multiple Subject Credential in a specific emphasis area. Students who elect to complete T Ed 160 in two semesters sign up for T Ed 160A (6 units) and T Ed 160B (6 units). T Ed 160B must include two weeks of full-time student teaching.

Program Requirements

1. *Subject Matter Competency:* Demonstrate subject matter competence through completion of the Liberal Studies Waiver program *or* pass the NTE Test of General Knowledge and receive faculty certification of competence.

2. *Professional Preparation:* *Units*

T Ed 110	3
T Ed 120CM	2
T Ed 130	3
T Ed 140	3
T Ed 148	4
T Ed 156M	3
T Ed 160	12
Total	30

3. *Completion of Bachelor's Degree:* California law requires a bachelor's degree in a subject area other than professional education.

Option III: Communicative Disorders. The Option III, Communicative Disorders program is designed for students who wish to prepare for specialization in special education in the area of communication handicapped children and youth.

Program Requirements

1. *Subject Matter Competency:* Complete an approved major in Communicative Disorders and pass the NTE Test of General Knowledge and receive faculty certification of competence.

2. *Professional Preparation:* *Units*

T Ed 110	3
T Ed 121	3
T Ed 130	3
T Ed 140	3
T Ed 150	3
T Ed 156M	3
T Ed 160	12
Total	30

3. *Completion of Bachelor's Degree:* California law requires a bachelor's degree in a subject area other than professional education.

Option IV: Postbaccalaureate Block Program. The Option IV program is designed to meet the needs of the re-entry student who has earned a bachelor's degree, has extensive work experience and wishes to return to the university to obtain a Multiple Subject Credential to teach in an elementary school. Students selecting this option register in a block of courses taught by a team of instructors. Candidates participate in classes or field assignments throughout a two-semester course of study. They also are required to student teach in various school settings which provide a variety of classroom experiences.

Program Requirements

1. *Subject Matter Competency:* Completion of a bachelor's degree with a major in a subject area other than professional education, pass the NTE Test of General Knowledge and receive faculty certification of competence.

2. *Professional Preparation:* *Units*

T Ed 110	3
T Ed 121	3
T Ed 130	3
T Ed 140	3
T Ed 150	3
T Ed 156M	3
T Ed 160	12
Total	30

Bilingual/Cross-Cultural Emphasis. The Bilingual/Cross-Cultural Emphasis program is designed to prepare students to teach in bilingual cross-cultural settings.

Program Requirements

1. *Subject Matter Competency:* Demonstrate subject matter competence by completing the Liberal Studies Waiver program, including the following courses: Area I (Ling 132 and 141); Area II (Span 118, 122 and 104); Area IV (CLS 116, 143 and 145) *or* pass the NTE Test of General Knowledge, the Bilingual Certificate of Competence Test and receive faculty certification of competence.

2. *Professional Preparation:* *Units*

T Ed 110	3
T Ed 121	3
T Ed 130	3
T Ed 138	3
T Ed 139	3
T Ed 140	3
T Ed 141	3
T Ed 150	3
T Ed 156M	3
T Ed 160	12
Total	39

3. *Completion of Bachelor's Degree:* California law requires a bachelor's degree in a subject area other than professional education.

Clear Multiple Subject Credential Programs (Fifth Year)

The Clear Multiple Subject Credential is required for full authorization to teach in a self-contained classroom in the state of California. To obtain this credential, the candidate must meet the following requirements:

General Requirements (See *General Requirements for Initial Admission — Preliminary Multiple Subject Credential.)*

Requirements for Admission to Student Teaching (See *Requirements for Admission to Student Teaching — Preliminary Multiple Subject Credential.)*

In addition to these requirements, the clear credential (fifth year) candidate must:

1. Complete an approved fifth year program containing 30 units of upper division/graduate credit taken after completion of all bachelor's degree requirements.

2. Include at least 30 units of professional education in the total five year credential program.
3. Complete a mainstreaming requirement (T Ed 162 or A S 111 or equivalent).
4. Complete a health education requirement (H S 120 or equivalent).
5. Complete the classroom computer application course (T Ed 134M).

Time Restrictions. All requirements for a Clear Multiple Subject Credential must be completed within five years of the date of issuance of the preliminary credential.

Single Subject Credential Program

The Single Subject Credential authorizes the holder to teach in the subject area specified on the credential in departmentalized classrooms commonly found at middle schools, high schools and adult educational settings. The Department of Teacher Education offers the Single Subject Credential in cooperation with 18 other university academic departments. The cooperating departments are primarily responsible for developing subject matter competency, while the Department of Teacher Education offers required coursework in professional education.

The Single Subject coordinator in the teacher education department provides general advisement to Single Subject Credential candidates. Area advisers (see below) provide academic advisement for credential candidates majoring in their respective departments, teach methods courses in their subject fields, assign and supervise student teachers, and act as official liaison between the subject matter departments and the Single Subject coordinator in the teacher education department.

Single Subject Majors and Advisers

Agriculture: R. Rogers
Art: D. Nadaner/P. Fleming
Business: R. Lacy
English: J. Hales
English — Drama: K. Morin
English — English as a Second Language: G. McMenamin
English — Speech: G. Anderson
Foreign Language: R. Freeman
Health Science: S. Sowby
Home Economics: F. Harkins
Industrial Arts: R. Blanton
Life Science (Biology): W. Collin
Mathematics: A. Hiatt
Music: R. McChesney
Physical Education: M. Irvin/M. Mott
Physical Science (Chemistry): H. Ono
Physical Science (Physics): B. Kehoe
Social Science: J. Echeverria

There are two types of Single Subject Credentials: the Preliminary Single Subject Credential and the Clear Single Subject Credential (Fifth Year).

General Requirements for Initial Admission

(Preliminary Single Subject Credential)

1. Provide evidence that you have successfully completed T Ed 50/Introduction to Teaching or submit an approved course waiver.
2. Complete an application to the credential program.
3. Verify admission to CSU, Fresno with a student I.D. card or a Notice of Admission.
4. Provide a complete set of transcripts of all prior college/university coursework. Transcripts are used to verify a GPA that is in the top 50 percent of the applicant's major field of study or discipline.
5. Complete an Admission Interview Form and obtain an interview from a Single Subject Credential faculty member and from the subject area academic adviser.
6. Obtain a medical clearance at the University Health Center.
7. Obtain appropriate clearance to teach in a public school by presenting a valid California Teaching Credential or applying for a Certificate of Clearance.
8. Show evidence of passing the California Basic Education Skills Test (CBEST) by presenting a CBEST Permanent Verification Card.
9. Obtain two completed "Recommendation for Admission to Teacher Education" forms written by instructors, supervisors or other individuals in a position to recommend for admission into a teacher education program.

Requirements for Admission to Student Teaching

(Preliminary Single Subject Credential)

A second admission step in the process of completing requirements for the Preliminary Single Subject Credential program is admission to student teaching.

Admission to Initial Student Teaching (T Ed 155A)

Authorization to begin student teaching requires that the candidate:

1. Submit a T Ed 155A application form by deadline.
2. Receive initial admission to the Single Subject Credential program.
3. Successfully complete or be enrolled concurrently in T Ed 151, 152 and 159. T Ed 156S must be taken concurrently with 155A or later with 155B.
4. Develop a fifth year program and have it approved by the School of Education and Human Development Single Subject coordinator and the academic area adviser.
5. Maintain a 3.0 GPA on all professional education courses.

Timelines for Admission to Initial Student Teaching (T Ed 155A) are listed below. Application forms are available in EdP, Room 120.

Semester Enrolled	*Application Requirements Completed*
Fall	April 1
Spring	November 1

Admission to Final Student Teaching (T Ed 155B)

Requirements for admission to final student teaching (T Ed 155B) include the following:

1. Submit a T Ed 155B application form by deadline.
2. Successfully complete T Ed 151, 152, 159 and 155A. T Ed 156S must be taken concurrently with 155B if it was not taken with 155A.
3. Successfully complete or be enrolled concurrently in T Ed 161 (depending on academic department policy).
4. Demonstrate subject matter competence by:
   (a) Completing an approved subject matter waiver program (See single subject majors and advisers) *or* pass the National Teachers Examination — Subject Matter Examination.
   (b) Receive authorization from the academic area adviser that subject matter competence has been met.

5. Maintain a 3.0 GPA on professional education coursework.
6. If granted an "Exception" admission, satisfy all requirements specified when the exception was granted.

Timelines for Admission to Final Student Teaching (T Ed 155B) are listed below. Application forms are available in EdP, Room 120.

Semester Enrolled	*Application Requirements Completed*
Fall	February 28
Spring	September 30

Program Requirements

1. *Subject Matter Competency:* Demonstrate subject matter competence, and complete approved subject matter waiver program or pass the NTE Subject Matter Examination.
2. *Professional Preparation:*

	Units
T Ed 151	3
T Ed 152	3
T Ed 159	3
T Ed 161	3
T Ed 155A	5
T Ed 155B	10
T Ed 156S	3
Total	30

3. *Completion of Bachelor's Degree:* California law requires a bachelor's degree in a subject area other than professional education.

Clear Single Subject Credential Program (Fifth Year)

The Clear Single Subject Credential is required for full authorization to teach in departmentalized classrooms commonly found at the middle school, high school and adult educational levels. To obtain this credential the candidate must meet the following admission requirements:

General Requirements (See *General Requirements for Initial Admission — Preliminary Single Subject Credential.)*

Requirements for Admission to Student Teaching (See *Requirements for Admission to Student Teaching — Single Subject Credential.)*

In addition to these requirements, the clear credential (fifth year) candidate must:

1. Complete an approved fifth year program containing 30 units of upper-division/graduate credit taken after completion of all bachelor's degree requirements.
2. Include at least 30 units of professional education in the total five year credential program.
3. Complete a mainstreaming requirement (T Ed 162 or A S 111 or equivalent).
4. Complete a health education requirement (H S 121 or equivalent).
5. Complete the classroom computer application course (T Ed 134S).

Time Restrictions. All requirements for a Clear Single Subject Credential must be completed within five years of the date of issuance of the preliminary credential.

Specialist Credentials/Certificate

Specialist Credentials may be earned by holders of Multiple Subject and Single Subject credentials. The specialist credential represents a year of postbaccalaureate study in an area of teaching specialization. Specialist credential programs offered through the Department of Teacher Education include: 1) Early Childhood Education and 2) Reading. The Language Development Specialist Certificate provides the skills useful to those teaching non-English speaking as well as limited English speaking students.

Early Childhood Education Specialist Credential

Admission Requirements. 1) Prerequisite: Completion of a Multiple Subject Credential or Single Subject Credential, 2) Completion of an Application for Admission to the Specialist Credential Program that must be approved by the program coordinator, 3) Attainment of Postbaccalaureate Standing (Credential only) or Graduate Standing (Credential and Master's Degree).

Program

1. *Course Requirements:*

	Units
T Ed 171, 231, 232, 241, 252, 271	15

(Select 15 units with approval of Early Childhood Education coordinator)

2. *Electives:*

Electives are selected from fields including special education, educational administration, bilingual education and other fields as determined in consultation with the Early Childhood Education faculty adviser	15
Total	30

3. *Experience:* Two years of successful teaching experience in Early Childhood Education.

Courses taken in the Early Childhood Specialist Credential program may be used to satisfy part or all of the Clear Credential (fifth year) requirements provided prior approval is obtained from the Early Childhood Education coordinator. Specialist Credential courses may also be used to meet part or all of the requirements for a master's degree. It is advised that application for the master's degree be completed at the same time the application for the Specialist Credential occurs (see the SOEHD Admissions and Records Office — EdP, Room 120 for admission information). For information about all Early Childhood Education programs, contact the Early Childhood Education Program coordinator.

Language Development Specialist Certificate

The Language Development Specialist (LDS) Certificate is designed for elementary and secondary teachers planning to work with limited English proficient (LEP) students in regular classrooms or in English as a second language programs. The LDS program is an approved means of preparation for meeting eligibility requirements for taking the LDS Certificate Examination administered by the California Commission on Teacher Credentialing.

Admission Requirements

1. Provide verification of admission to CSU, Fresno.
2. Provide verification of Basic Teaching Credential.
3. Provide complete set of transcripts of all prior college/university work.
4. Possess undergraduate GPA of 2.75.

5. Complete prerequisite coursework in linguistics.
6. Complete the application to the SOEHD Graduate Program.
7. Complete a Statement of Purpose.
8. Provide three letters of recommendation.
9. Complete an entrance interview.

Program

Course Requirements:	*Units*
T Ed 136, 215, 138, 175, 122L*	12–15
Ling 132, 141, 147, 171*	9–12
*Students take either T Ed 122L or Ling 171	
Total	24

Reading Specialist Credential

Admission Requirements

1. Complete application for postbaccalaureate standing at California State University, Fresno.
2. Complete application for Admission to School of Education and Human Development Graduate Programs.
3. Possess a GPA of 2.75+ overall, or over the last 60 semester units.
4. Obtain three letters of recommendation.
5. Complete an autobiography that includes your reasons for beginning an M.A. degree in Reading and a statement of your professional goals.
6. Score a minimum of 450 in the Verbal section of the Graduate Record Examination (GRE).
7. Successfully complete 15 semester units of Education coursework, including A S 153, Educational Statistics, or its equivalent.
8. Possess a basic teaching credential.

Program

Course Requirements:	*Units*
A S 220 (285 or 288) and (298B or 299)	10
T Ed (213 or 214), 215, 224, 234A, 234B, 244, 254, 278	24
Electives:	
T Ed 120CL, 120LA, 120ST, 138, 139, 164A, 164B, 180T, 213, 214, 280T; Ling 132, 136, 140T, 146, 147, 148; Drama 137; Psych 126, or other electives selected in consultation with the faculty program adviser	5
Total	39

Completion of a Master's Degree in Reading

Experience: 1) Completion of a one semester supervised field experience (T Ed 254) after completion of the master's degree and 2) three years of successful teaching experience at any grade level (K–12).

Courses taken in the Reading Specialist Credential program may be used to satisfy part or all of the Clear Credential (Fifth Year) requirements for either Multiple Subject or Single Subject credential, provided prior approval is obtained from the Fifth Year Adviser. See the SOEHD Admissions and Records Office — EdP, Room 120 for admission information. For information about Reading Specialist Credential contact the Reading Program coordinator.

Agriculture Specialist Credential — Single Subject

The Agriculture Specialist Credential is offered jointly by the School of Education and Human Development and the School of Agricultural Sciences and Technology. This credential authorizes candidates to teach vocational agriculture classes in the secondary school setting.

Admission Requirements

1. Completion of a bachelor's degree majoring in agriculture education.
2. Attainment of postbaccalaureate classified standing.

Program

1. Completion of all required courses in professional education (See *Program Requirements — Single Subject Credential.)*
2. Completion of an approved fifth-year program of 30 postbaccalaureate units.
3. Completion of a mainstreaming requirement (T Ed 162 or A S 111)
4. Completion of a health education course (H S 121)

For additional information contact the School of Education and Human Development single subject coordinator and the program adviser in the School of Agricultural Sciences and Technology.

Mini Corps. This program is designed to help students and teachers preparing to work in bilingual classrooms obtain credentials. Stipends and grants are available. Additional information may be obtained from San Ramon 5, Room 221.

Bilingual Teacher Training Program. Additional information at the Educational Support Service Center, San Ramon 2, Room 45.

Master's Degree Programs

Master of Arts Degree in Education — Curriculum and Instruction

The Master of Arts degree in Education with a concentration in curriculum and instruction is designed to provide professional and specialized preparation for the candidate interested in acquiring knowledge and skills essential for the design and development of curriculum related instructional practices. In addition to basic foundations, the student becomes knowledgeable and skilled in a unique area of specialization within education curriculum and instruction. Students may use the program to meet fifth year credential requirements for the basic teaching credential.

Admission Requirements for Classified Standing. See *General Admission Requirements* in the *Education — Graduate Program* section of this catalog.

Program. Prerequisites: 15 units in professional education coursework including A S 153; completion of prerequisites required for enrollment in advanced coursework in the area of specialization.

Course Requirements:	*Units*
A S 220, (285 or 288), (298B or 299)	10
T Ed 250 or A S 272, T Ed 275	6
T Ed 272, 274, 275, 282, 284, 286	3–6
Electives:	
Select courses from the School of Education and Human Development or from a special subject area with consultation and approval of the program adviser	8–11
Total	30

Master of Arts Degree in Education — Early Childhood Education

The Master of Arts degree in Education with a concentration in early childhood education offers specialized preparation for a wide variety of positions in educational settings with children

from birth through the primary grades. The program is designed to meet individual needs of candidates with different experiential and educational backgrounds and varied career objectives. Students may use the program to meet fifth year credential requirements for the basic teaching credential.

Admission Requirements for Classified Standing. See *General Admission Requirements* in the *Education — Graduate Program* section of this catalog.

Program. Prerequisites: A S 153 and 12 additional units in Education or Child Development and an adequate background for advanced work in the interest field.

Course Requirements:	*Units*
A S 220, (285 or 288), 298B or 299)	10
T Ed 171, 231, 232, 241, 252, 271	15
(Select 15 units with approval of Early Childhood Education coordinator)	
Approved Electives	5
Total	30

Master of Arts Degree in Education — Reading

The Master of Arts degree program in Education with a concentration in reading is designed to provide professional and specialized preparation for classroom and resource teachers and consultants; diagnosticians, and supervisors in reading clinics, schools, and community colleges. It enables graduates to do consulting and editing for publishing companies and to pursue advanced graduate study in universities offering the doctoral degree.

Admission Requirements for Classified Standing. See *General Admission Requirements* in the *Education — Graduate Program* section of this catalog.

Program. Prerequisites: 15 units in professional education coursework including A S 153.

Course Requirements:	*Units*
A S 220 (285 or 288) and (298B or 299)	10
T Ed (213 or 214 or 215), 224, (234A or 234B) 244, 278	15
Approved electives: T Ed 120CL, 120LA, 120ST, 138, 139, 164A, 164B, 180T, 234A, 234B, 213, 214, 215, 280T; Ling 132, 136, 140T, 146, 147, 148; Drama 137; Psych 126, or other approved electives.	5
Total	30

COURSES

Note: Students must provide their own transportation to off-campus sites for classes, student teaching, practica and field activities and defray any resulting personal expense.

Teacher Education (T Ed)

AR. Reading Skills (1–2). Designed to improve reading abilities. Emphasis on improving vocabulary, comprehension, and flexibility in reading rate. Lecture-discussion approach with directed reading. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

1R. College Planning Skills (2). Seminar in skills, techniques and strategies designed to address the educational needs of those students who may be experiencing difficulty in their *academic and personal adjustment to college life. CR/NC* grading only; not applicable toward baccalaureate degree requirements.

50. Introduction to Teaching (2). Orientation to role of teacher in public schools; observation of teacher-pupil interaction, instructional approaches, classroom management in elementary, secondary and/or middle schools; two hour lecture weekly, plus two hour school site observation weekly, not including travel. *CR/NC* grading only.

101. Practicum in Tutoring (1–3). Skills in tutoring individuals and small groups. Study habits, problem solving, writing and test-taking skills. Field work in tutoring. Not applicable for public school credentials.

110. Initial Student Teaching (1–3; max total 3). Prequisite: admission to Multiple Subject program; T Ed 130, 140 or concurrent enrollment; T Ed 150,156M must be taken concurrently, except Option II and IV. Supervised activities and teaching in public school classrooms. Minimum of 40 minutes per day per unit, with additional conference periods. *CR/NC* grading only. (Instructional Materials Fee: $2.50 per unit, maximum $7.50)

120. Problems in Education (2–3; repeatable with different topics). In-depth study of various areas in education including children's literature (CL), classroom organization, management, and mainstreaming (CM), curriculum (CU), kindergarten (KG), language arts (LA), nursery school (NS), science (SC), social studies (SS), storytelling (ST). Selected topics may require activities.

121. Mathematics in the Elementary School (3). Prerequisite: admission to the Multiple Subject Program and satisfy General Education quantitative analysis requirements (see section on G.E. requirements). Methods and materials for developing the mathematics concepts and skills taught in the elementary school. A variety of manipulative materials are applied in a lab setting. (2 lecture, 2 lab) (Former T Ed 120MA)

122F. Field Work in Outdoor Education (1–2; max total 2). Prerequisite: T Ed 130 or T Ed 152; permission of instructor. Practice at camp with responsibilities of counseling, camp leadership, curriculum planning and evaluation; utilization of resource people from several disciplines.

122L. Field Work in Language Development (3). Prerequisite: admission to Language Development Specialist Program and T Ed 136, 138, 175, 215; Ling 132, 141, 147. Field experience in classrooms with 10 or more Non-English Proficient (NEP) or Limited-English Proficient (LEP) students. Supervised teaching activities having language development emphasis. Conferences, observations and visitations by arrangement.

130. Psychological Foundations of Education (3). Not open to students with credit in T Ed 152. Prerequisite: admission to the Multiple Subject Credential Program; Psych 10. Facts, ideas, and principles fundamental to an understanding of educational procedures in teaching and learning and to the growth and development of children.

134. Educational Applications of Microcomputers (3). Prerequisite: T Ed 50 or permission of instructor. Methods for using the microcomputer as a teacher and student productivity tool, an instructional tutor, and a means of developing critical thinking skills to achieve curriculum objectives. *(Important: T Ed 134M and T Ed 134S are not interchangeable. Multiple Subject Credential candidates must enroll in "M" sections; Single Subject Credential candidates must enroll in "S" sections.)* (Instructional Materials Fee: $5) (2 lecture, 2 lab) (Former T Ed 180T section)



135. Audio-Visual Education (2). Evaluation, selection, and utilization of various types of contemporary instructional materials, systems, and equipment. Laboratory experiences in the operation of equipment and materials design.

136. Multicultural Education (3). Helps teachers cope effectively with diverse student needs in a plural society. Considers ethnic, socio-economic, sex, religious, other subcultural differences and problems of curriculum and instruction in multi-group classrooms.

137. Creative Dramatics (3). (See Drama 137.)

138. Teaching the Linguistically Different (3). In-depth study of principles and problems of new bilingual and bicultural modes in the education of the culturally and linguistically different child of Hispanic descent in the U.S.A. Contrasting linguistic, cultural, learning styles, including classroom implications.

139. English/Spanish Literacy (3). Prerequisite: Spanish fluency and permission of instructor. Methods and materials for bilingual/cross-cultural classrooms. A practical look at language arts methodologies for English and Spanish; the teaching of reading in Spanish for native speakers; ESL methods for bilingual and non-English proficient (NEP) students in public schools.

140. Cultural Foundations of Education (3). Not open to students with credit in T Ed 151. Prerequisite: admission to the Multiple Subject Credential Program. Functions of education in America's multicultural society; role of school and teacher; impact of social conflict and interaction on the school's function; relationship between school and community.

141. Spanish Storytelling (3). Prerequisite: Spanish fluency and permission of the instructor. Collecting and reading of Spanish genres of children's literature from elementary schools. Riddles, myths, games, stories, etc. are collected and adapted for use with Spanish speakers. (Former T Ed 180T section)

147. Early Childhood Curriculum for Children with Special Needs (3). Modifications in either mainstreamed or special settings to help teachers adapt the early education curriculum to meet the needs of young children with special needs. Course includes teaching techniques, criteria for selection of appropriate materials and provisions for adapting physical classroom environment.

148. Integrated Curriculum (4). Prerequisite: admission to the Multiple Subject Credential Program, Option II; completion of or concurrent enrollment in T Ed 110, 130, 140. Taken in place of T Ed 150 by students in Option II program. Integration of curriculum and use of instructional resources in early childhood programs and the elementary school (K–6); methods of teaching. Lecture supported by curriculum development activities. (3 lecture, 2 activity hours)

150. Curriculum and Instruction in Elementary Schools (3). Prerequisite: admission to the Multiple Subject Credential program, T Ed 130 and 140 (or concurrent enrollment) and T Ed 110 and 156M taken concurrently. Current conceptions of curriculum and instructional resources in the elementary school; methods of teaching.

151. Social Foundations of Education (3). Not open to students with credit in T Ed 140. Prerequisite: admission to the Single Subject Credential Program. Scope and function of secondary schools; social, historical and philosophical influences; curriculum, recent trends and issues.

152. Psychological Foundations of Education (3). Not open to students with credit in T Ed 130. Prerequisite: Psych 10; admission to Single Subject Credential program. Educational psychology; growth and development, learning, personality and self concepts of adolescents; implications for learning and teaching.

155A. Student Teaching in Secondary School (5). Prerequisite: admission to the Single Subject Credential program; T Ed 151, 152, and 159 must be taken prior to or concurrently with 155A. Student teaching in middle school under clinical supervision; assignment requires three hours per day, Monday through Friday. *CR/NC* grading only.

155B. Student Teaching in Secondary School (5 or 10; max total 10). Prerequisite: admission to student teaching; T Ed 155A, 161 (or concurrent); senior standing; approval of major department; completion of waiver program or passing of appropriate National Teachers Examination. Student teaching in a secondary school under clinical supervision; minimum 150 hours for each 5 units. *CR/NC* grading only.

155C. Student Teaching in Secondary School (12). Not open to students with credit in T Ed 155B. Prerequisite: admission to student teaching; T Ed 155A, 161 (or concurrent); senior standing; approval of major department; completion of waiver program or passing of appropriate National Teachers Examination. Student teaching in a secondary school under clinical supervision; minimum 360 hours. *CR/NC* grading only.

156M. Reading in the Elementary School (3). Prerequisite: admission to the Multiple Subject Credential program; T Ed 130 and 140 (or concurrent enrollment) and T Ed 110 and 150 (Option II: 148) to be taken concurrently. Theories of reading; methods and materials for teaching the skills and process of reading; provision for individual differences (ethnic, socio-economic, dialectal); reading motivation activities; and reading evaluation procedures for the elementary program. (Former T Ed 156)

156S. Content Area Reading in the Secondary School (3). Prerequisite: admission to the Single Subject Credential program; concurrent enrollment in T Ed 155A or 155B. Reading instructional techniques appropriate for use in content area subjects including theories, methods and materials for the development of vocabulary comprehension, writing, and study skills (grades 7–12).

157. Conservation of Natural Resources (3). (See Biol 157.)

158. Communication and Learning (3). No credit will be given if the student has taken Spch 114. (See Spch 114 for course description.)

159. Curriculum and Instruction (3). Prerequisite: admission to the Single Subject Credential Program; T Ed 151 and 152 or concurrent enrollment. Instructional planning, methodologies of teaching and learning, evaluation techniques, motivation, classroom management and discipline, preparation and evaluation of materials. Microteaching practice and analysis. (Instructional Materials Fee: $5) (2 lecture, 2 lab hours)

160A. Student Teaching in Elementary School (6). Prerequisite: admission to the Multiple Subject Credential program; completion of all requirements for admission to student teaching. Supervised teaching in public school classrooms; assignment requires a minimum of one half day, five days per week. *CR/NC* grading only.

160B. Student Teaching in Elementary School (6). Prerequisite: admission to the Multiple Subject Credential program; completion of all requirements for Admission to Student Teaching. Supervised teaching in public school classrooms; assignment requires a minimum of one-half day, five days per week. Assignment also requires two weeks of full-time teaching. *CR/NC* grading only.

160C. Student Teaching in Elementary School (12). Prerequisite: admission to a Multiple Subject Credential program; completion of all requirements for Admission to Student Teaching. Supervised teaching in public school classrooms; assignment is daily for full school day. Assignment also requires two weeks of full-time teaching. *CR/NC* grading only.

161. Methods and Materials in Secondary Teaching (3). Prerequisite: T Ed 152, admission to credential program or teaching experience. A methods course in secondary school subjects. Instructional procedures, techniques, and resources for teaching; appraisal of instructional innovations; classroom organization and management; measurement and evaluative techniques. Some areas have labs.

162. Mainstreaming (2). Prerequisite: T Ed 130 or 152; 110 or 155A. Special education environment in academic and non-academic curriculum, organization of classroom, referral practices in mainstreaming, individual educational prescriptions, and non-discriminatory assessment. Interpretation of state and local guidelines.

164A. Practicum: Diagnosis and Tutorial Reading for Grades K–6 (3). Supervised diagnosis and tutoring experience with an elementary school remedial reader. Six hours of additional testing is required throughout the semester. (Instructional Materials Fee: $15) (2 lecture, 2 lab)

164B. Practicum: Diagnosis and Tutorial Reading for Grades 7–12 (3). Supervised diagnosis and tutoring experience with a middle school or secondary school remedial reader. Six hours of additional testing time is required throughout the semester. (Instructional Materials Fee: $15) (2 lecture, 2 lab)

166. Reading Improvement (2). A course to improve reading abilities. Emphasis placed on improving vocabulary, comprehension, and flexibility in reading skills.

171. Principles of Early Childhood Education (3). A comprehensive study of the field of early childhood education, including principles of early childhood education, parent relations, use of community resources, and organization of programs in early childhood education.

175. Strategies for Teaching and Evaluating LEP/NEP Students (3). Prerequisite: T Ed 136 and 138; Ling 132 and 134; or permission of instructor. Methods and materials for teaching and evaluating K–12, limited and non-English proficient students, including strategies for interrelating language instruction with content area subject matter. Special emphasis on techniques for developing and assessing listening, speaking, reading and writing.

180T. Topics in Education (1–3; max total 9). Issues and topics in educational foundations; curriculum and instruction; early childhood, elementary, middle school, and secondary education; pupil personnel services; supervision and administration; child abuse and computer literacy.

190. Independent Study (1–3; max see reference). (See *Academic Placement — Independent Study.)* Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.*)

213. Teaching the Language Arts K–12 (3). Seminar in the study of the English language arts. Objectives, curriculum, materials, and research in oral and written communication; project required.

214. Literature for Children and Youth (3). Prerequisite: admission to program or permission of instructor. Seminar in literature for children and youth; critical interpretation of juvenile literature; emphasis upon impact of changing social and cultural patterns in books for children and youth; project required.

215. Language Issues in Reading (3). Prerequisite: T Ed 156M or 156S or permission of the instructor. Seminar exploring cognitive development and language acquisition as related to oral and written communications from both social and historical perspectives. Study of the relationship between reading and writing processes. Examination of the special language needs relative to bilingual and bi-dialectal learners.

221. Early Childhood Education: Classroom Ecology and the Child with Special Needs (3). A study of classroom environment with a focus on the relationship, attitudes and actions of teachers, children, parents and staff who interact in a regular classroom with a mainstreamed child. (2 lecture, 2 lab hours)

224. Assessment and Development of Reading Abilities (3). Prerequisite: T Ed 278. Analysis of reading performance utilizing observation, interview procedures and diagnostic instruments. Consideration of methods and materials for instruction and the leadership role of the reading specialist. (2 lecture, 2 lab hours) (Former Educ 224)

231. Curriculum in Early Childhood Education (3). Prerequisite: T Ed 171; admission to Early Childhood Emphasis or Specialist program. Concepts underlying curriculum and development for children eight years and younger. Teacher's role in planning, implementing, and assessing curriculum and development of teaching strategies. (2 lecture, 2 lab hours)

232. Reading and Language Arts in Early Childhood Education (3). Prerequisite: admission to program or approval of instructor. Examines development of oral and written language skills in young children. Explores theories, curricula, and strategies for teaching language arts and beginning reading.

234A. Clinical Experiences in the Assessment and Development of Reading Abilities for Grades K–6 (3). Prerequisite: T Ed 224. Clinical experiences in the supervised application of principles learned in T Ed 224. Emphasis on individual and small group evaluation and instructional procedures for grades K–6. (Instructional Materials Fee: $10) (2 lecture, 2 lab hours) (Former T Ed 234)

234B. Clinical Experiences in the Assessment and Development of Reading Abilities for Grades 7–12 (3). Prerequisite: T Ed 224. Clinical experiences in the supervised application of principles learned in T Ed 224. Emphasis on individual and small group evaluation and instructional procedures for grades 7–12. (Instructional Materials Fee: $10) (2 lecture, 2 lab hours)

241. Field Work in Early Childhood Education (3). Prerequisite: admission to Early Childhood Emphasis or Specialist program. Supervised experiences in work with young children and their families in at least two different levels including pre-school, kindergarten, and primary. (Minimum of 135 hours)

Language is what makes us human, and its preservation is in books.

Arne Nixon
Professor, Teacher Education

244. Research in Reading Curriculum (3). Prerequisite: T Ed 224 and permission of instructor. Study of selected curricula; planning curriculum in reading; effective ways of dealing with the functions and duties of reading specialists and consultants.

250. Seminar in Curriculum (3). Prerequisite: teaching credential. Theory and practice of curriculum development, evaluation, and revision. Study of contemporary problems and curricular approaches to meet societal needs. *CR/NC* grading only.

252. Mathematics and Science in Early Childhood Education (3). Prerequisite: admission to Early Childhood Education Emphasis or Specialist program or permission of instructor. Theoretical study of mathematics and science knowledge acquisition for young children. Develop appropriate science and mathematics curriculum materials. Review of literature and related research. (2 lecture, 2 lab hours)

254. Supervised Field Experiences in Reading (3). Prerequisite: T Ed 224, 244, and permission of instructor. Intensive varied supervised field experiences involving diagnosis and treatment of reading difficulties; development or refinement of reading programs; evaluation of reading instruction; application of interpersonal communications and group process skills.

271. Comparative Cultures in Early Childhood (3). Ways in which culture affects personality, language and cognitive development. Similarities and differences in education and socialization in a variety of cultural settings are studied. Curricula for Multicultural education in ECE are included. (2 lecture, 2 lab hours)

272. Instructional Planning and Evaluation (3). Principles and practices of instructional planning, assessment and testing of learning outcomes, performance appraisal and evaluation of teaching; test construction analysis, and grading.

273. Secondary School Curriculum (3). Prerequisite: T Ed 155B (may be taken concurrently). Seminar on concepts and principles of curriculum planning, evaluation of curriculum programs and processes, assessment and utilization of curriculum resources, and innovations and research in curriculum development.

274. Social Interaction in Teaching (3). In-depth study of the dynamics of effective interpersonal relations in the classroom with students; and beyond, with administrators, parents, and colleagues. Strategic interaction for creative, low-stress teaching and learning based upon related theory and research. (2 seminar, 2 lab hours)

275. Practicum in Curriculum Development (1–6; max total 6). Prerequisite: teaching credential. Study and application of contemporary research in curriculum development.

278. Seminar in Reading Theories (3). Prerequisite: T Ed 156M or 156S or permission of the instructor. Identification and investigation of current reading theories and application of theory to classrooms. Independent research review on a selected reading topic and reporting of findings.

280T. Advanced Topics in Education (1–3). Prerequisite: permission of instructor. Advanced, in-depth analysis of issues and problems in educational foundations; curriculum and instruction; reading; early childhood, elementary, middle school, and secondary education; and computers in education. Emphasis placed on advanced research.

282. Philosophy of Education (3). Seminar on philosophical issues in educational theory and practice and their historical backgrounds. Educational implications of current and historical systematic philosophical outlooks and ideological trends.

284. Seminar in International Education (3). Analysis of historical, social and political forces which shape national education endeavor. Emerging international education efforts and organizations.

286. Social Issues in Education (3). Prerequisite: T Ed 140 or T Ed 151, or course in sociology or anthropology and permission of instructor. Seminar for analysis of effect on institutional and ideological trends and problems on the role and operation of the school in American society.

287. Seminar in History of Educational Thought (3). Prerequisite: T Ed 282, or philosophy course and permission of instructor. Seminar on historical foundations of educational theory; growth of thought regarding teaching and learning; relationship of educational theory and practice in the United States.

290. Independent Study (1–3; max see reference). (See *Academic Placement — Independent Study.*) Approved for *SP* grading.

IN-SERVICE COURSES *(T Ed)*

(See *Course Numbering System.*)

Note: T Ed 306, 316, and 326 are equivalent to the CSU consortium courses Designated Subjects 306, 316, and 326. They satisfy specified requirements for the Designated Subjects Credential for Adult and Vocational Education.

306. Foundations of Adult/Vocational Education (3). Scope and function of adult education, curriculum principles and practices, instructional techniques and media, student and instructional evaluation; applicable on a B.S. degree in Vocational Education.

316. Seminar in Adult/Vocational Education (3). Prerequisite: T Ed 306. Community and occupational relationships, work experience, counseling and guidance, leadership development, community and cultural differences; applicable on a B.S. degree in Vocational Education.

326. Independent Study in Adult/Vocational Education (3). Prerequisite: T Ed 316. Individually prescribed assignments in terms of candidate's educational and occupational background and teaching field; applicable on a B.S. degree in Vocational Education.

328. Techniques of Teaching (4). For the part-time Ryan Designated Subject credential candidate. Learning processes, curriculum and media, instructional techniques and practices, and evaluation of student achievement. This course will not be accepted for degree credit.

353. Curriculum Problems and Practices (1–3; max total 12 if no topic repeated). Prerequisite: teaching credential. Individual or group projects in curriculum analysis, implementation, and evaluation; implications of individual differences and environmental factors. Written report required. May not be applied to a master's program.

361. General Methods of Teaching (3). Basic principles of teaching and application to the classroom; implications of methods for classroom management, motivation, pupil behavior and reporting to parents; preparation of instructional plans and evaluation instruments.

363F. Field Work in Curriculum (1–3; max total 6, if no project repeated). Prerequisite: regular credential or recommendation of the principal. Special projects in curriculum implementation and evaluation. Individual or group projects. Written report submitted to instructor and school district (individual or group conference hours arranged).

380T. Topics in Education (1–6; max total 12). Studies in theory, procedures and application in such areas as social forces, professional activities, technology and instructional innovations.

381. Planning and Organizing Outdoor Education (3). Prerequisite: teaching experience. Role of the public school in promoting learning opportunities outside the classroom; outdoor science, conservation, education, health and safety, group living, camp work experience, and nature study; responsibilities of classroom teachers for outdoor leadership. (Seminar, lab, field trips)

383. Problems in Child Study (2; max total 12, if no study area repeated). Methods of studying children; relationship of child study groups, reviews of research findings in child development and adolescent behavior.

395. Supervision of Student Teachers (2; max total 4). Prerequisite: postbaccalaureate standing, teaching experience. Supervision and evaluation of student teachers; role of the supervising classroom teacher, college supervisor and other personnel. *CR/NC* grading only.

EDUCATION
Graduate Program

School of Education and Human Development
Barbara G. Burch, Dean
Ed/Psych Building, Room 133
(209) 278-2623

Robert H. Monke, Associate Dean and
Graduate Degrees Program Coordinator
Ed/Psych Building, Room 120
(209) 278-3084

M.A. in Education
M.A. in Special Education
M.S. in Counseling

Advanced Credentials in:
Administrative Services
Early Childhood Education Specialist
Language Development Specialist
Pupil Personnel Services
Reading Specialist
Special Education Specialist



The School of Education and Human Development (SOEHD) offers advanced and specialized preparation required for awarding master's degrees and/or advanced specialist or services credentials. The SOEHD offers three master's degree programs in separate areas of professional emphasis. These degree programs include:

1. Master of Arts degree in Education with the following options: administration and supervision, curriculum and instruction, early childhood education, reading, and school counseling.
2. Master of Arts degree in Special Education.
3. Master of Science degree in Counseling with the following options: a) career development counseling and b) marriage, family and child counseling.

Master's degree programs can be pursued concurrently with fifth year (postbaccalaureate) teaching credential, specialist credential, or services credential programs. For information regarding the fifth year (clear) teaching credential program, contact the fifth year adviser in the School of Education and Human Development (EdP 111). Information pertaining to specialist and services credentials can be obtained by contacting individual program coordinators located in either the Department of Teacher Education or the Department of Advanced Studies.

Some master's degree programs are designed to provide special preparation for employment in non-school settings such as the M.S. in Counseling degree program that meets the academic requirements needed for the state authorized Marriage, Family and Child Counseling License.

For information and advisement pertaining to School of Education and Human Development master's degree programs, please consult the appropriate department and program coordinator:

M.A. in Education

- Administration and Supervision. (See Department of Advanced Studies/coordinator of Administrative Services Program.)
- Curriculum and Instruction. (See Department of Teacher Education/coordinator of Curriculum and Instruction.)
- Early Childhood Education. (See Department of Teacher Education/coordinator of Early Childhood Education.)
- Reading. (See Department of Teacher Education/coordinator of Reading.)
- School Counseling. (See Department of Advanced Studies/coordinator of Counselor Education.)

M.A. in Special Education. (See Department of Advanced Studies/coordinator of Special Education Program.)

M.S. in Counseling. (See Department of Advanced Studies/coordinator of Counselor Education.)

- Career Development Counseling.
- Marriage, Family and Child Counseling.

General Admission Requirements for Classified Standing

In addition to making application for admission to the university through the CSU, Fresno Admissions Office, consult the School of Education and Human Development graduate degrees program coordinator: 1) for program information, 2) for School of Education and Human Development graduate programs admission forms, 3) for any specific program application forms, and 4) for assignment to an appropriate adviser.

All students applying for admission to a master's degree program in the School of Education and Human Development must meet the minimum admission requirements listed below and be approved for admission by the Faculty Review Committee. Evidence of completion of these requirements is to be submitted along with required forms in **one complete packet** to the SOEHD Graduate Programs Office (EdP 120) by the application closing date. A completed admissions packet will include:

1. Verification of admission to CSU, Fresno.
2. An application to the School of Education and Human Development graduate programs.
3. A complete set of transcripts of all prior college or university work.
4. Evidence of a minimum undergraduate GPA of 2.75 overall or on the last 60 undergraduate units.
5. A statement of purpose.
6. Three letters of recommendation from persons in a position to make an evaluation in support of program entry.
7. Evidence of successful completion of A S 153, Educational Statistics, or equivalent.
8. Evidence of receipt of a passing score required on the Graduate Record Examination — General Aptitude Test.
9. If an international student, evidence of receipt of a passing score required on the Test of English as a Foreign Language (TOEFL). The School of Education and Human Development also retains the option to require international students to obtain additional preparation if English usage skills are judged to be inadequate.
10. Evidence of writing proficiency by one of the following:
    a. Obtaining a passing score on the Upper-Division Writing Exam.
    b. Completing English 160W with a grade of *B* or better.
    c. Obtaining a passing score on the CBEST.
11. Include in the packet any additional requirements unique to each degree and program within the degree (refer to M.A. programs in education and the M.S. program in counseling). See graduate programs offered through the Department of Advanced Studies and the Department of Teacher Education.

Required application packets are available in the SOEHD Graduate Program Office (EdP 120).

Individual Program Requirements

Complete any additional requirements unique to each degree and program within the degree (refer to M.A. programs in education, and special education and the M.S. program in counseling). See graduate programs offered through the Department of Advanced Studies and the Department of Teacher Education.

Application Deadlines. Deadlines for submitting SOEHD Master's Degree Programs admission materials are:

Semester Enrolled	*Application Requirements Completed*
Summer	March 1
Fall	March 1
Spring	October 1

Applicants are required to attain classified standing (be fully admitted) in a master's degree program no later than the semester in which they complete 10 units of coursework that they expect to be applied toward their degree program.

Applicants are encouraged to complete all program application requirements prior to or during the first semester of enrollment in the degree program. Early completion of application materials assures timely review and written notification of admission status.

Program Faculty Review. Following submission of all application requirements, the program faculty representing each master's degree program reviews the application. Written notification is then sent regarding whether or not admission has been granted.

Appeal of Admissions Decision. Applicants who have received written notification of denial of admission have an opportunity to submit a formal appeal for special consideration to the program faculty. An appeal for special consideration must be submitted within two weeks of the date of the letter of denial in order to be considered by the program faculty during the same semester.

Advancement to Candidacy/ Completion of Master's Degree

For information regarding advancement to candidacy and procedures needed to complete the master's degree, please contact the School of Education and Human Development graduate degrees program coordinator, located in EdP 120.

The School of Education and Human Development Graduate Office maintains a record center for all students who are working toward a master's degree in the School of Education and Human Development. It also maintains liaison between the Division of Graduate Studies and Research and departments in the School of Education and Human Development offering master's degree programs.

In order to ensure selection of courses that will be acceptable on a master's degree program, candidates should consult with the appropriate program coordinator.

Advanced Credential Programs

Advanced credential programs are categorized as 1) specialist credentials and 2) services credentials. These credentials require professional preparation at the postbaccalaureate level. All specialist and services credentials (except for Pupil Personnel) require successful completion of a basic Multiple Subject or Single Subject credential.

Specialist Credential Programs. Specialist Credential programs include:

1. Early Childhood Education. (See Department of Teacher Education/coordinator of Early Childhood Education.)
2. Reading. (See the Department of Teacher Education/coordinator of Reading.)
3. Special Education:
   - Learning Handicapped.
   - Severely Handicapped.

   (See the Department of Advanced Studies/coordinator of Special Education.)
4. Language Development Specialist Certificate. (See the Department of Teacher Education/adviser of the Language Development Specialist.)

Services Credential Programs

1. Administrative:
   - Preliminary Administrative.
   - Professional Administrative.

   (See the Department of Advanced Studies/coordinator of Educational Administration.)
2. Pupil Personnel.
   (See the Department of Advanced Studies/coordinator of Counselor Education.)

Specialist and services credential programs can be pursued concurrently with a fifth year (postbaccalaureate) teaching credential (Multiple Subject or Single Subject) and/or a master's degree. For information regarding the fifth year (clear) teaching credential program, contact a fifth year adviser in the SOEHD (EdP 111).

For information pertaining to the SOEHD master's degree programs, consult with the appropriate program coordinator or the SOEHD Graduate Programs Office (EdP 120).

Admission Requirements for Advanced Credential Programs. For admission requirements for advanced specialist and services credential programs, refer to the specific program information found in catalog sections for the Department of Advanced Studies and the Department of Teacher Education. Application materials and forms are available in the SOEHD Graduate Programs Office (EdP 120).

Admission requirements for advanced credential programs are to be completed along with required forms and submitted **in one complete packet** to the SOEHD Graduate Programs Office (EdP 120).

Admission Deadlines. Applicants are required to be fully admitted to a specific advanced credential program no later than the semester in which they complete 10 units of coursework that they expect to be applied toward their credential program.

Applicants are encouraged to complete all program application requirements prior to or during the first semester of enrollment in a specific credential program. Early completion of application materials assures timely review and notification of admission status.

Program Faculty Review. Following submission of all application materials, the program faculty representing each advanced credential program reviews the application. Written notification is then sent regarding whether or not admission has been granted.

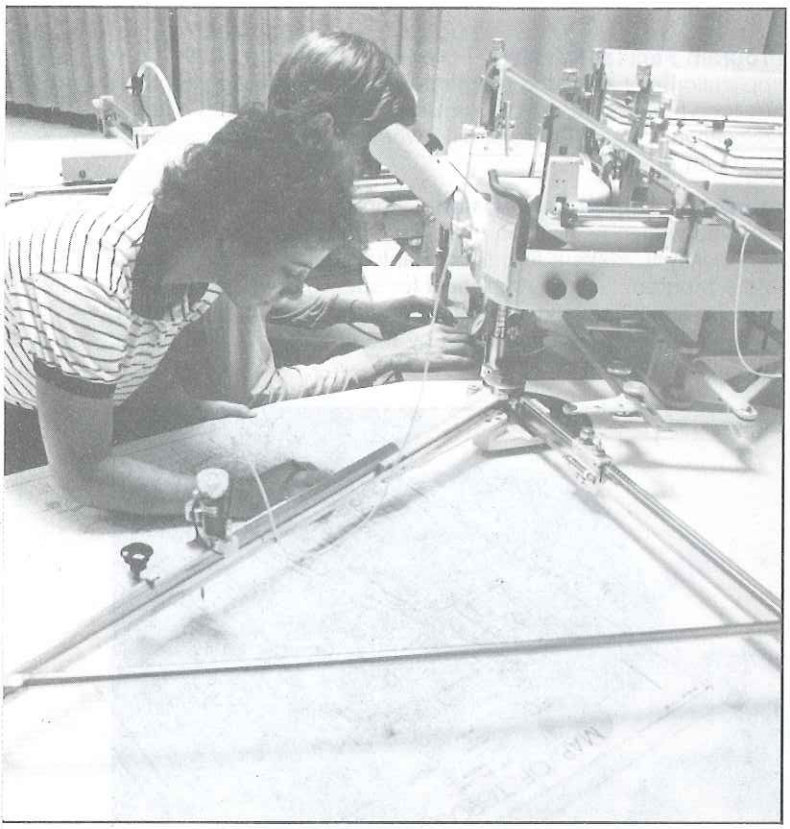
Appeal of Admission Decision. Applicants who have received written notification of denial of admission have an opportunity to make a formal appeal for special consideration to the program faculty. An appeal for special consideration must be submitted within two weeks of the date of the letter of denial in order to be considered by the program faculty during the same semester.



ENGINEERING
Civil and Surveying Engineering

School of Engineering
Department of Civil and Surveying Engineering
Karl E. Longley, Chair
Engineering East Building, Room 126
(209) 278-2889

B.S. in Civil Engineering
B.S. in Surveying Engineering
M.S. in Civil Engineering



The Department of Civil and Surveying Engineering offers programs of study leading to the Bachelor of Science degrees in civil engineering and surveying engineering. Both programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology which represents the major professional engineering groups in the United States, including the American Society of Civil Engineers, American Congress on Surveying & Mapping and American Society for Engineering Education.

Civil engineering includes the research, development, planning, design, construction and maintenance associated with urban development, water supply, structures, energy generation and transmission, water treatment and disposal, and transportation systems. The civil engineer deals with the function and safety of such public facilities as buildings, bridges, dams, pipelines, powerplants, highways, and harbors and is concerned with the protection of the public against natural hazards of earthquakes, floods, landslides and fires.

The graduate curriculum leading to an M.S. in Civil Engineering degree provides specialized training in the fields of structural engineering and applied mechanics, soil mechanics and foundation engineering, environmental engineering, hydrology and hydraulic engineering, highway engineering and surveying engineering to meet the challenges of advances of recent years in technology and the escalation of urban problems.

Surveying engineering includes the science of making measurements to determine the relative positions of points on or near the earth's surface (surveying) and the science of making accurate measurements from photographs or other types of imagery (photogrammetry). Surveying engineers apply their knowledge to locating land and water property boundaries, collecting terrain data for engineering planning, making measurements for guiding construction operations and accurately establishing horizontal and vertical control points for scientific and engineering works. Besides map making, photogrammetry is used for a wide variety of unusual measurements such as: topology of the human body, nondestructive testing of engineering materials, monitoring structural deformations and for architectural and anthropometric measurements.

Faculty and Facilities

The department has 14 full-time faculty whose teaching and research specialties cover every area of civil engineering and surveying engineering. Most faculty members are licensed as civil engineers or land surveyors and have a wide range of professional experience in engineering design, analysis, research and development, and project planning and management.

Excellent laboratory facilities exist for testing of soils and construction materials, hydraulics testing, and water quality analysis.

Career Opportunities

Employment opportunities for civil engineers in industry, state and federal government agencies remain at a high level as a result of increasing urban growth and land development, and the recent emphasis on the maintenance and repair of the nationwide highway system. Civil engineers are also in demand to meet the growing challenge of cleaning the environment.

Opportunities for specialists in surveying engineering continue to grow with rapid advancements in analytical photogrammetry, geographic information systems, and inertial and satellite positioning methods. Most graduates of this program have been employed by the federal and state government agencies, oil and gas and other private industry.

Many graduates have earned professional license as civil engineer or land surveyor within a few years of leaving school and are in private practice.

Faculty

Karl E. Longley, *Chair*

Chandra S. Brahma
James K. Crossfield
Wayne P. Dominick
John Hatzopoulos
Mushtaq Hussain
Joseph Kao
Riadh Munjy
Fareed W. Nader
Walid Rimawi
Walter F. Rowland
Jankie N. Supersad
Mohamad Yousef

Bachelor of Science Degree Requirements
Civil Engineering Major

	Units
1. Major requirements	74
C E 20, 85, 121, 121L, 123, 123L, 124, 128, 129, 130, 132, 133, 140, 142, 142L, 150, 161, 180, 185	(42)
S E 15, 15L	(4)
ECE 70, 90	(5)
I E 160	(2)
M E 26, 112, 136	(9)
Approved Electives	(12)
Select from courses in one or more of the following groups.	
Subject to the below statement concerning design courses.	
Selection of asterisked courses requires the dean's prior approval.	
Environmental Water Quality: C E 140, 144, 145; Biol 133*	
Geotechnical: C E 125, 134	
Structures: C E 131, 135, 136, 137; M E 144	
Surveying: S E 23, 23L, 41	
Transportation: C E 140, 151, 152, 153; S E 41	
Water Resources: C E 140, 141, 143, 144	
Additional approved electives: C E 190, 191T; I E 161	
Design Courses: at least 6 units of approved electives must be selected from the following design courses: C E 125, 134, 135, 136, 141, 144, 151; S E 41.	
2. Additional requirements	
Geol 1; Math 76, 77, 81	16
3. General Education requirements	49
CORE: Engl 1; Spch 3, 7, or 8; Math 75; Hist 11 or 12; Pl Si 2 or 101; I E 182W	(19)
BREADTH: Chem 1A; Bot 10; Phys 5A and 5B; 3 units from Divisions 5 or 7, Pl Si 120; Phil 120; 3 units from Division 4 (select from Psych 61, 132, 171; H S 90, 124)	(30)
CAPSTONE: Satisfied by Phil 120 and Pl Si 120 from BREADTH	(–)
Total	139

Note:

1. Courses in mathematics, the physical sciences or engineering taken *CR/NC* are not counted toward fulfillment of degree requirements in Civil Engineering.
2. Since the Civil Engineering major curriculum is very demanding, many students, especially those not fully prepared in mathematics, chemistry and/or physics, take 4½ or more years to graduate rather than the traditional 4 years. Students not fully prepared in mathematics and/or chemistry should consider taking Math 71 and 72 in lieu of Math 75, and Chem 3A in lieu of Chem 1A. If needed, students also may go to the Learning Assistance Center in the Keats Building and request free tutorial assistance.

Recommended Program

FIRST SEMESTER		Units
C E 85	Introduction to Civil Engineering	1
S E 15, L	Engineering Surveying	4
ECE 70	FORTRAN 77 Programming	2
Math 75	Mathematical Analysis I	4
Engl 1	Composition	3
Spch 3, 7, or 8		3
		17

SECOND SEMESTER		
M E 26	Engineering Graphics	3
Math 76	Mathematical Analysis II	4
Phys 5A	Principles of Physics I	5
Hist 11/12	American History	3
Div. 4	Personal Life and Growth (See [2])	3
		18

THIRD SEMESTER		
C E 20	Engineering Mechanics: Statics	3
Math 77	Mathematical Analysis III	4
Phys 5B	Principles of Physics II	5
Chem 1A	General Chem and Qual. Analysis	5
		17

FOURTH SEMESTER		
Humanities	(See [1])	3
Math 81	Applied Analysis	4
Pl Si 2/101	American Constitution	3
Bot 10	Plant Biology	3
Geol 1E	Physical Geology	4
		17

FIFTH SEMESTER		
C E 121, L	Mechanics of Materials	4
C E 150	Transportation Planning and Design	3
M E 112	Engineering Mechanics Dynamics	3
C E 128	Civil Engineering Hydraulics	3
C E 129	Engineering Hydraulics Lab	1
I E 182W	Engineering Writing	3
		17

SIXTH SEMESTER		
C E 123, L	Soil Engineering	4
C E 124	Concrete Laboratory	1
C E 130	Theory of Structures	3
C E 142, L	Environmental Engineering	4
C E 140	Hydrology	3
Phil 120	Contemporary Conflicts of Morals	3
		18

SEVENTH SEMESTER		
C E 132	Reinforced Concrete Design	3
C E 161	Construction Engr I	3
I E 160	Engineering Economy	2
M E 136	Thermodynamics	3
Approved Electives		6
		17

EIGHTH SEMESTER

C E 133	Design of Steel Structures	3
C E 180	Senior Project	2
ECE 90	Principles of Electrical Circuits	3
Approved Electives		6
C E 185	Civil Engineering Practice	1
Pl Si 120	International Politics	3
		18

[1] Humanities: Select one course from Divisions 5 or 7.
[2] Personal Life and Growth: Select one course in Division 4 from Psych 61, 132, 171; H S 90, 124.

Master of Science in Civil Engineering Degree Requirements

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Project.)*

Admission. The requirements for graduate admission to California State University, Fresno must be met. To be admitted to the program, applicants should possess a bachelor's degree in civil engineering or field related to civil engineering from an institution accredited by the Accreditation Board for Engineering and Technology. To be admitted, students must have a 2.7 grade point average in the last 60 semester-units attempted, on the basis of 4.0 being *A,* or the approval of the Graduate Committee of the School of Engineering. If an applicant's preparation is deemed insufficient by the Graduate Committee of the School of Engineering, the applicant is required to take additional courses which are specified in writing to remove the deficiency. Such courses, taken as an unclassified student, are in addition to the minimum of 30 semester hours credit for the master's degree in engineering.

Continuation in the Program. Prior to their being admitted to classified standing, students are required to take the Graduate Record Examination. The minimum grade considered passing is quantitative 450. The advanced portion of the examination for engineering is not required. The student, together with an adviser, completes a contract program within his/her first semester of coursework taken for graduate credit. This program must be approved by the department's Graduate Committee. Satisfactory progress toward completion of the contract program is a requirement for continuation in the program. Students must maintain a 3.0 average on all coursework attempted while enrolled as a graduate student. A minimum of 12 semester hours must be earned before the average is determined.

Program. Each master's degree student selects, as early as possible during the first semester of attendance, and upon consulting with and securing the approval of the major field adviser, a program best suited to his/her interests and objectives.

The M.S. in Civil Engineering degree requires the completion of a program of study containing 30 units of the following requirements:

Plan A

(a) 200-series engineering courses	12–24
(b) 100-series engineering undergraduate elective courses	0–6
(c) Outside of the Department of Civil and Surveying Engineering — 100 series upper-division and 200 series graduate courses in engineering, mathematics, statistics, management, business, geology, physics, chemistry, health sciences, biology or other disciplines best suited to the student's graduate program as approved by the program adviser.	0–12
(d) Thesis 299	6
Total	30

Under this plan the total units from (b) and (c) may not exceed 12 units with not more than 6 units being 100 series upper-division courses.

Plan B

(a) 200-series engineering courses	15–27
(b) 100-series engineering undergraduate elective courses	0–6
(c) Outside of the Department of Civil and Surveying Engineering — 100 series upper-division and 200 series graduate courses in engineering, mathematics, statistics, management, business, geology, physics, chemistry, health sciences, biology or other disciplines best suited to the student's graduate program as approved by the program adviser.	0–12
(d) Project 298	3
Total	30

Under this plan the total units from (b) and (c) may not exceed 12 units with not more than 6 units being 100 series upper-division courses.

Plan C

(a) 200-series engineering courses	18–30
(b) 100-series engineering undergraduate elective courses	0–6
(c) Outside of the Department of Civil and Surveying Engineering — 100 series upper-division and 200 series graduate courses in engineering, mathematics, statistics, management, business, geology, physics, chemistry, health sciences, biology or other disciplines best suited to the student's graduate program as approved by the program adviser.	0–12
(d) Comprehensive Final Examination	–
Total	30

Under this plan the total units from (b) and (c) may not exceed 12 units with not more than 6 units being 100 series upper-division courses.

Undergraduate courses that may be used as electives:

M E 144	Advanced Mechanics of Materials (3)
I E 161	Legal Aspects of Engineering (2)
C E 125	Geotechnical Engineering Design (3)
C E 131	Intermediate Theory of Structures (3)
C E 134	Foundation Design (3)
C E 135	Reinforced and Prestressed Concrete Design (3)
C E 136	Design of Timber Structures (3)
C E 137	Seismic Analysis of Structures (3)
C E 141	Water Resources Engineering (3)
C E 143	Engineering Hydraulics (3)
C E 144	Design of Water Quality Control Processes (3)
C E 151	Pavement Design (3)
C E 153	Traffic Operations and Control (3)
C E 191T	Topics in Civil Engineering (3)
S E 109	Surveying Astronomy (3)
S E 125	Analytical Photogrammetry (3)
S E 135	Advanced Survey Computations (3)
S E 140	Earth Resources Surveying (3)
S E 145	Geopositioning (3)

S E 147 Surveying Instrumentation (3)
S E 151 Boundary Control and Legal Principles (3)
S E 152 Surveying Systems (3)
S E 161 Data Collector Interfacing (3)
S E 191T Topics in Surveying Engineering (1–3; max total 3)

Graduate Courses (C E)

204 Engineering Planning and Operations (3)
205 Computing in Engineering Analysis (3)
206 Environmental Engineering and Planning (3)
220 Advanced Foundation Engineering (3)
230 Advanced Theory of Structures (3)
232 Advanced Reinforced and Prestressed Concrete (3)
233 Advanced Steel and Timber Design (3)
234 Theory of Plates and Shells (3)
235 Finite Element Analysis (3)
237 Dynamics of Structures (3)
240 Engineering Hydrology (3)
242 Water Resources Planning and Management (3)
244 Unit Operations and Processes (3)
245 Industrial and Hazardous Waste Treatment (3)
246A, B Advanced Water Quality (3, 3)
247 Solid and Hazardous Wastes Engineering (3)
251 Advanced Boundary Law (3)
261 Geoprocessing (3)
271 Geodetic Systems Optimization (3)
275 Satellite Surveying (3)
280 Surveying Engineering Seminar (1; max total 3)
281 Civil Engineering Seminar (1; max total 3)
283 Digital Remote Sensing (3)
285 Advanced Analytical Photogrammetry (3)
286 Geographic Information Systems Design (3)
290 Independent Study (1–3)
291T Topics in Civil Engineering (1–3; max total 15)
298 Project (3)
299 Thesis (6)

COURSES

Civil Engineering (C E)

10. Engineering Skills (2). Provides engineering students with experience in solving problems and presenting solutions in a logical manner, introduces students to subject areas common to most engineering disciplines and develops basic skills for solving problems through an engineering approach. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

20. Engineering Mechanics: Statics (3). Prerequisite: Math 77 (or concurrently), Phys 5A. Analysis of force systems, equilibrium problems, section properties; graphic, algebraic and vector methods of problem solution. (2 lecture, 2 lab hours) (CAN ENGR 8)

21. Statics for Electrical Engineers (2). Prerequisite: Math 77 (or concurrently), Phys 5A. Not open to majors outside of the Electrical Engineering Department. Analysis of static force systems by scalar and vector methods. Determination of section properties.

85. Introduction to Civil Engineering (1). The civil engineering profession and its career opportunities; creative thinking and critical thinking as integral parts of the engineering decision process; engineering methods of analysis.

110. Computer Applications in Civil Engineering (3). Prerequisite: ECE 70, C E 130. Use and modification of existing programs. Creation of new programs. Use of structured language, spreadsheets, and data base management software. Interactive design and graphic displays. Design orientation. Term projects. (Former C E 191T section)

121. Mechanics of Materials (3). Prerequisite: C E 20. Application of principles of mechanics to find stresses and deformations in machine and structural members.

121L. Mechanics of Materials Laboratory (1). Prerequisite: C E 121 (or concurrently). Application of principles and methods of testing to verify theory and determine limitations of principles of mechanics of materials. (3 lab hours)

123. Soil Engineering (3). Prerequisite: C E 121. Physical and mechanical properties of soil as an engineering material; studies and design applications in permeability, one and two dimensional flows, seepage through earth dams and coffer dams, porewater pressure and excess porewater pressure; compressibility, stress-strain relationships and strength characteristics; case histories.

123L. Soil Engineering Laboratory (1). Prerequisite: C E 121L, 123 (or concurrently). Experiments to illustrate and amplify the principles of soil mechanics. (3 lab hours; field trips required)

124. Concrete Laboratory (1). Prerequisite: C E 121L. Proportioning of concrete mixes; admixtures; workability tests; compressive, flexural, and tensile strength tests; reinforced concrete. (3 lab hours; field trips required)

125. Geotechnical Engineering Design (3). Prerequisite: C E 123. Theory and design of embankment and cut slopes, surcharging and sand drains, dewatering systems and ground control, excavation and support systems, field compaction and grouting systems; construction considerations and case histories.

127. Construction Soils and Foundation (3). Not open to civil engineering majors. Prerequisite: upper-level standing. Physical and mechanical properties of soil, construction applications of soils engineering design, field control during construction, field problems and remedial measures, and case histories. (Former C E 191T section)

127L. Construction Soil Lab (1). Not open to civil engineering majors. Prerequisite: C E 127 (concurrently). Laboratory experiments and sessions to reinforce principles of soil mechanics as well as foundation design and illustrate the use of soil as a construction material. (3 lab hours and field trips required)

128. Civil Engineering Hydraulics (3). Prerequisite: M E 112 or concurrently. Fundamentals of civil engineering hydraulics with application to hydraulic structures.

129. Engineering Hydraulics Lab (1). Prerequisite: C E 128 or concurrently. Experiments and demonstrations in fluid properties, flow management, pipe flow, open channel flow, pumps, and hydraulic scour. (3 lab hours)

130. Theory of Structures (3). Prerequisite: C E 121. Trusses and frames analyzed by algebraic and graphic procedures; influence lines and live loading analysis; rigid frames analyzed by slope deflection and moment distribution. Introduction to matrix methods.

131. Intermediate Theory of Structures (3). Prerequisite: C E 130. Analysis of statically indeterminate beams, trusses, and frames; column analogy; advanced topics in slope deflection and moment distribution; matrix methods.

132. Reinforced Concrete Design (3). Prerequisite: C E 130. Analysis and design of reinforced concrete structural elements using the Ultimate Strength Design Method. Computer applications. Introduction to the Alternate Method. Introduction to prestressed concrete. (2 lecture, 3 lab hours; field trips required)

133. Design of Steel Structures (3). Prerequisite: C E 130. Design of steel members and systems for buildings. Design areas include: tension members, compression members, beams, beam-columns, connections and plate girders. (2 lecture, 3 lab hours)

134. Foundation Design (3). Prerequisite: C E 123, 132 (or concurrently). Theory and design of spread and continuous wall rectangular, cantilever and trapezoidal footings; earth pressures and cantilever as well as gravity retaining walls; pile foundations and pile driving; construction considerations; load tests; subsurface investigations; and case histories.

135. Reinforced and Prestressed Concrete Design (3). Prerequisite: C E 132. Design of typical reinforced concrete and prestressed concrete structures. (2 lecture, 3 lab hours; field trip(s) required)

136. Design of Timber Structures (3). Prerequisite: C E 130. Design of timber members and systems for buildings. Design areas include: loads, properties of wood, tension members, beams, columns, beam-columns, connections, diaphragms, shear walls and glued laminated arches.

137. Seismic Analysis of Structures (3). Prerequisite: C E 130, M E 112. Analysis of response of structures to dynamic loads with emphasis on response to earthquake ground motion. Basic concepts in design of earthquake-resistant buildings. (Field trip(s) required)

140. Hydrology (3). Prerequisite: C E 128. The Hydrologic cycle, atmospheric conditions, precipitation, infiltration, ground water, soil moisture, evaporation, runoff, streamflow, hydrographs, flood routing, hydrologic frequency analyses and their effects in water resource planning and management.

141. Water Resources Engineering (3). Prerequisite: C E 140. Analysis and design of water distribution and sewerage systems, facilities for pavement drainage and other selected water resource projects. (Field trips required)

142. Environmental Engineering (3). Prerequisite: C E 128 and C E 140 (or concurrently). Introduction to the planning and design of water and wastewater treatment facilities, hazardous and solid waste treatment and disposal facilities, air pollution control facilities and noise pollution control.

142L. Environmental Quality Laboratory (1). Prerequisite: C E 142 (or concurrently). Study and analysis of physical, chemical and biological characteristics of air, water and solid wastes.

143. Engineering Hydraulics (3). Prerequisite: C E 128. Theory and analysis of pressure-conduit and open-channel flow systems. Applications to hydraulic structures and control works, hydraulic power conversion, sediment transport, and channel stabilization.

144. Design of Water Quality Control Processes (3). Prerequisite: C E 142 or senior-level chemical or biological science. The process and hydraulic design of physical, chemical and biological water purification and wastewater treatment facilities for water quality control. (Field trips required)

145. Unit Operations and Processes (3). Prerequisite: C E 142L. Analysis of the unit operations and unit processes used in the physical, chemical and biological control of raw and waste waters quality. (2 lecture, 3 lab hours)

150. Transportation Planning and Design (3). Prerequisite: S E 16. Transportation as a multimode system; functions, development, elements, and characteristics. Transportation planning; design of geometric elements of route and terminal. (2 lecture, 3 lab hours)

151. Pavement Design (3). Prerequisite: C E 123 (or concurrently). Factors affecting pavement performance. Structural design of flexible and rigid highway and airfield pavements. Pavement overlays, recycling, rehabilitation and management system.

152. Transportation Engineering Materials (2). Prerequisite: C E 123. Soil stabilization with bitumen, lime and portland cement for pavement construction; properties of bituminous road materials; properties, design and testing of bituminous paving mixtures for pavement construction. (1 lecture, 3 lab hours; field trips required)

153. Traffic Operations and Control (3). Prerequisite: C E 150 (or concurrently). Highway traffic characteristics and studies; comprehensive transportation planning; traffic regulation and control; environmental considerations; traffic engineering administration.

161. Construction Engineering I (3). Prerequisite: senior standing in civil engineering. Basics of civil engineering contracting, organization of construction firms, legal structures, project funding, cash flow, equipment costs, labor relations and safety.

170. Pollution and Society (3). Not open to civil engineering majors. A description of the natural environment. Identification of both man-made and natural environmental impacts. The incorporation of a rational process into environmental decision making. Case histories of specific environmental problems. General Education CAPSTONE Cluster. (Field trips required)

180. Senior Project (2). Prerequisite: senior standing in civil engineering; approved subject; I E 182W (or concurrently). Study of a problem under supervision of a faculty member; final typewritten report required. (Individual project except by special permission.)

185. Civil Engineering Practice (1). Prerequisite: senior standing in Civil Engineering. Practice of Civil Engineering; opportunities in Civil Engineering; transition from student to professional engineer; engineering ethics. (Field trips required)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

191T. Topics in Civil Engineering (1–3; max total 6). Prerequisite: permission of instructor. Investigation of selected civil engineering subjects not in current courses.

193. Internship in Civil Engineering (2–4; max total 4). Prerequisite: permission of adviser. Engineering practice in a consulting, industrial or government work setting. Each cooperative internship period usually spans a summer–fall or spring–summer interval. This course cannot be used to meet graduation requirements. *CR/NC* grading only.

GRADUATE COURSES *(C E)*

(See *Course Numbering Systems.*)

204. Engineering Planning and Operations (3). Planning, scheduling and allocation of resources for engineering processes, including long-range planning, work breakdown structures, network analysis, computer modeling and engineering communications. (Former Engr 204)

205. Computing in Engineering Analysis (3). Prerequisite: graduate status in engineering. Solution of engineering problems using digital computation. Modeling of engineering systems for numerical analysis. (Former Engr 205)

206. Engineering Environmental Impact (3). Identification of environmental impacts due to engineering projects. The incorporation of environmental considerations into engineering design. Alternative solutions to engineering problems. Case histories of selected engineering projects. Special design problems are assigned relating to the student's field of interest. (Former Engr 206)

220. Advanced Foundation Engineering (3). Prerequisite: graduate standing. Design of cantilevered and anchored sheet-pile walls; axial- and lateral-loaded pile groups; drilled piers; pile driving stresses and wave equation analysis; beams on elastic foundations; footings on expansive and non-uniform soils and on rock; and case histories. (Former Engr 291T section, 220)

230. Advanced Theory of Structures (3). Prerequisite: graduate standing in engineering or permission of instructor. Analysis of indeterminate structures by force (flexibility) methods and by displacement (stiffness) methods; Matrix methods suitable for digital computer solutions. Virtual work, real and complementary energy. Classical structural theorems. Introduction to the finite element method. (Former Engr 230)

232. Prestressed Concrete (3). Prerequisite: graduate standing in engineering or permission of instructor. Properties of hardened concrete. Failure mechanisms, influence of load and environment history. Structural behavior and design of prestressed concrete elements and systems: Continuous beams, frames, slabs. Partial prestress. (Field trips required) (Former Engr 232)

233. Advanced Steel and Timber Design (3). Prerequisite: graduate standing. Material behavior and design of basic structural units. Topics in steel: inelastic buckling, lateral-torsion buckling, plate girders, composite design, plastic design. Topics in wood: glulam structural units, pole-type structures, structural diaphragms. (Former Engr 233)

234. Theory of Plates and Shells (3). Prerequisite: graduate standing in engineering or permission of instructor. Methods of calculating stresses and deformations in plates and shells used in engineering structures. Bending of circular and rectangular plates under various conditions. Membrane and flexural analysis of shells of revolution. (Former Engr 234)

235. Finite Element Analysis (3). Prerequisite: graduate standing in engineering or permission of instructor. Theoretical and conceptual bases for formulation of finite element representations in solid mechanics. Development of element stiffness matrices for plane stress and plane strain problems, bending of plates and deformation of shells. (Former Engr 235)

237. Dynamics of Structures (3). Analysis of structural members and systems subject to dynamic loads. Basic theory for single-degree-of-freedom and multi-degree-of-freedom analytical models; free vibration, harmonic and transient excitation, response spectrum, Lagrange's equations, earthquake analysis. (Former Engr 291T Section)

240. Engineering Hydrology (3). Prerequisite: M E 116. Analysis of the physical and stochastic processes governing the occurrence and movement of water in its natural environment. Applications to hydraulic engineering practice. (Former Engr 240)

242. Water Resources Planning and Management (3). Prerequisite: graduate standing in engineering or permission of instructor. A study of the interrelations of engineering, economic, legal, political, administrative, ecological, and social factors involved in the planning and management of water resources. (Former Engr 242)

244. Unit Operations and Processes (3). Prerequisite: C E 246A and 246B (or concurrently). Laboratory investigation employing the use of pilot plants as part of the design process; analysis of the unit operations and unit processes used in the physical, chemical, and biological treatment of water and wastewater. (1 lecture, 6 lab hours)

245. Industrial and Hazardous Waste Treatment (3). Prerequisite: graduate standing in engineering or permission of instructor. The application of engineering process to treatment and disposal of liquid industrial and hazardous wastes. Evaluation of treatment and disposal alternatives with emphasis on recovery processes. (Former Engr 245)

246A. Advanced Water Quality (3). Prerequisite: C E 142 or permission of instructor. Theory and practice of physical/chemical processes for controlling water quality, including chemical equilibrium and kinetics; mass transfer mechanisms; physical separation processes; adsorption, exchange, and membrane-based processes; disinfection.

246B. Advanced Water Quality (3). Prerequisite: C E 142 or permission of instructor; C E 246A recommended. Theory and practice of biological processes for controlling water quality, including suspended growth systems; attached growth systems; ponds; land treatment. Also sludge treatment processes, including biological stabilization, thickening, and dewatering; sludge disposal.

247. Solid Wastes Engineering (3). Planning and design of waste collection and disposal systems. Waste segregation and energy impact related to recovery and recycling practices. Environmental impact and institutional issues related to solid and hazardous waste systems. (Former Engr 247)

251. Advanced Boundary Law (3). Prerequisite: S E 151 or equivalent. Land and water boundary legal issues and McDean Boundary Law Developments. Specialized group and individual boundary case law investigations. (Former Engr 291T section)

261. Geoprocessing (3). Prerequisite: S E 173 or equivalent. Integration of computer technologies for gathering, analyzing and displaying data associated with the earth's spatial features. Engineering design problems dependent on competing factors. (Former Engr 291T section)

271. Geodetic Systems Optimization (3). Prerequisite: S E 108 or equivalent. National geodetic networks; planimetric and vertical control systems; geodetic control densification; network optimization criteria and methodology.

275. Satellite Surveying (3). Prerequisite: graduate standing. Discussion of GPS orbital theory, data collection and processing algorithms, network adjustments, project design and optimization techniques. Review of current research trends and applications. (Field trips required) (Former Engr 275)

280. Surveying Engineering Seminar (1; max total 3). Prerequisite: graduate standing. Current CSUF surveying engineering research presented and discussed by faculty and graduate students. Oral presentation and written report documenting ongoing research activities required. (Former Engr 280)

281. Civil Engineering Seminar (1; max total 3) Prerequisite: graduate standing. Current CSUF civil engineering research presented and discussed by faculty and graduate students. Oral presentation and written report documenting ongoing research activities required. (Former Engr 281)

283. Digital Remote Sensing (3). Prerequisite: S E 140 or equivalent. Quantitative approach in remote sensing; digital image characteristics, error correction, registration; geometric and radiometric image enhancement; image classification; system design; remote sensing and G.I.S. (Former Engr 291T section)

285. Advanced Analytical Photogrammetry (3). Prerequisite: S E 125 or equivalent. Mathematical models in photogrammetry; bundle block adjustment, self-calibration; close-range photogrammetry; real time photogrammetry and data snooping. System design; hardware and software considerations in photogrammetry.

286. Geographic Information Systems Design (3) Prerequisite: S E 173 or equivalent. Data structures and algorithms, data bases for G.I.S., error modeling and data uncertainty, visualization, data exchange and standards, the multipurpose cadaster, advanced analysis techniques.

290. Independent Study (1–3; max total 3). Prerequisite: graduate status in engineering. See *Independent Study.* Approved for *SP* grading. (Former Engr 290)

291T. Topics in Engineering (1–3; max total 6). Prerequisite: permission of instructor. Investigation of selected engineering topics. (Former Engr 291T)

298. Project (3; max total 3). Prerequisite: graduate status in engineering. See *Criteria For Thesis and Project.* Independent investigation of advanced character such as analysis and/or design of special engineering systems or projects; critical review of state of art of special topics, as the culminating requirement for the master's degree. Abstract required. Approved for *SP* grading. (Former Engr 298)

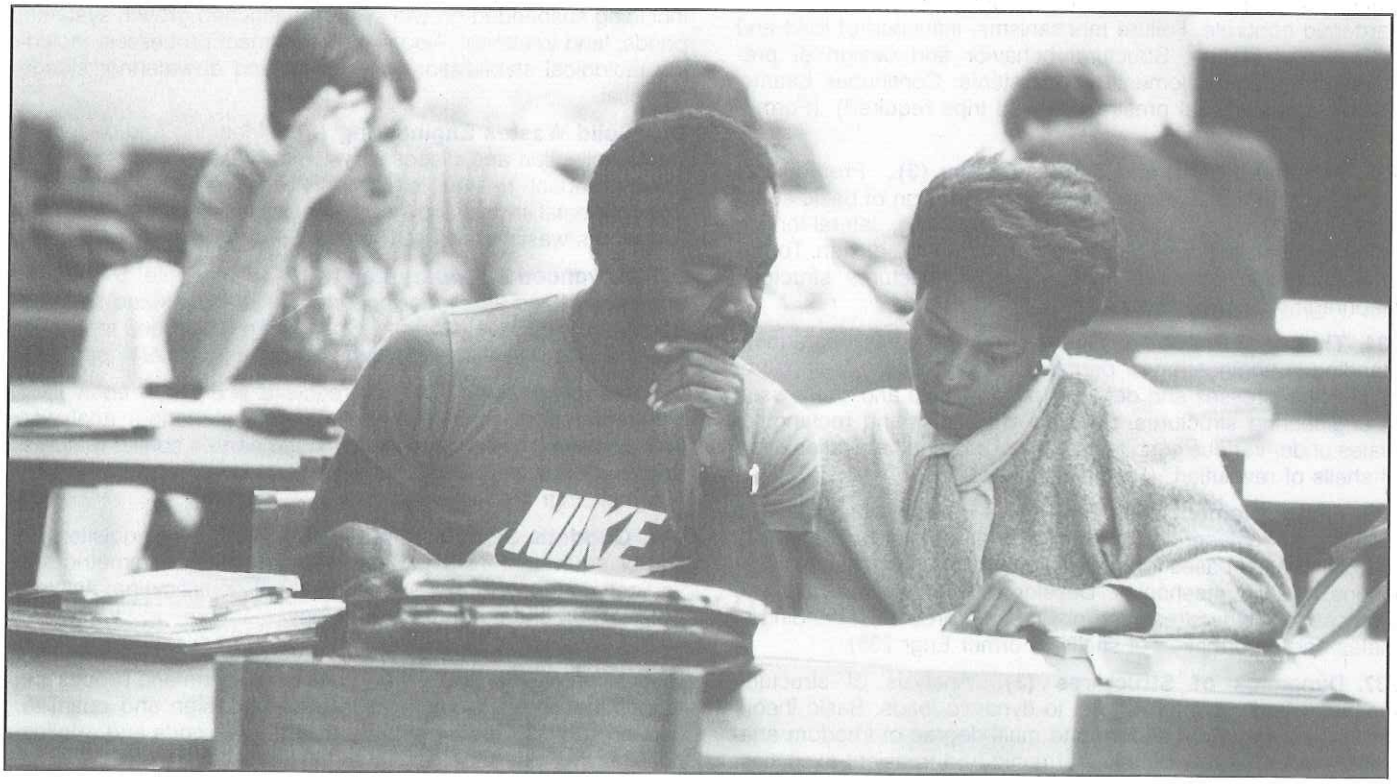
299. Thesis (6; max total 6). Prerequisite: See *Criteria For Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for master's degree. Approved for *SP* grading. (Former Engr 299)

IN-SERVICE COURSES *(C E)*

(See *Course Numbering System.*)

311. Professional Examination Review (2; may be repeated in different fields). Prerequisite: bachelor's degree in engineering or eligibility to take state registration examinations. Review of engineering fundamentals for those qualified to take the state examination for certification as engineer-in-training; or review in a specific field (civil, electrical, mechanical, or other) for those preparing to take the examination for registration as professional engineer.

321. Professional Engineering Seminar (1–3; may be repeated in different fields). Prerequisite: bachelor's degree in engineering or related field, or experience as a professional engineer. Latest developments in various specialized areas of professional engineering practice; new materials, design and construction methods, equipment, devices and procedures.



Bachelor of Science Degree Requirements
Surveying Engineering Major

	Units
1. Major requirements	77
S E 15, 15L, 16, 16L, 23, 23L, 34, 41, 41L, 50, 61, 66, 102, 102L, 108, 123, 125, 126, 135, 145, 151, 159, 171, 173, 180	(60)
I E 160	(2)
M E 26	(3)
Approved Electives	(12)
Select from the following courses with at least 6 units from engineering courses: C E 20, 150, 161; Math 101, 121; S E 100, 101, 105, 109, 121, 140, 147, 152, 161, 186, 190, 191T; C R P 135; B A 154; Fin 180, 181; I E 125, 161; Mgt 104.	
2. Additional requirements	8
Math 76 and 77	(8)
3. General Education requirements	52
CORE: Engl 1; Spch 3, 7, or 8; Math 75; Hist 11 or 12; Pl Si 2 or 101; I E 182W	(19)
BREADTH: Geol 1; Chem 3A; Bot 10; Phys 5A and 5B; 3 units from Divisions 5 or 7; Phil 120; Art 30; Pl Si 120	(33)
CAPSTONE: Satisfied by Phil 120 and Pl Si 120 from BREADTH	(–)
Total	137

Notes:

1. Courses in mathematics, the physical sciences or engineering taken *CR/NC* are not counted toward fulfillment of degree requirements in Surveying Engineering.
2. Since the Surveying Engineering major curriculum is very demanding, many students, especially those not fully prepared in mathematics, chemistry and/or physics, take 4½ or more years to graduate rather than the traditional 4 years. If needed, students may go to the Learning Assistance Center in the Keats Building and request free tutorial assistance.

Recommended Program

FIRST SEMESTER		Units
S E 15, L	Engineering Surveying	4
S E 61	Microcomputers in Surveying Engineering	3
Math 75	Mathematical Analysis I	4
Engl 1	English Composition	3
		14

SECOND SEMESTER		
S E 16, L	Municipal Surveying	3
S E 23, L	Photogrammetry	3
Math 76	Mathematical Analysis II	4
Geol 1	Physical Geology	4
Art 30	Photography	3
		17

THIRD SEMESTER		
S E 41, L	Route Surveying	3
S E 66	Computer Aided Mapping	3
Math 77	Mathematical Analysis III	4
Phys 5A	Principles of Physics I	5
Hist 11/12	American History	3
		18

FOURTH SEMESTER		
S E 34	Survey Computations	3
S E 50	Land Surveying	3
Phys 5B	Principles of Physics II	5
Chem 3A	Introductory General Chemistry	4
M E 26	Engineering Graphics	3
		18

FIFTH SEMESTER		
S E 108	Geodesy	3
S E 123	Stereo-Photogrammetry	3
S E 135	Advanced Survey Computations	3
I E 182W	Engineering Writing	3
Bot 10	Plant Biology	3
Humanities (Select from General Education divisions 5 or 7)		3
		18

SIXTH SEMESTER		
S E 102, L	Geodetic Surveying	3
S E 125	Analytical Photogrammetry	3
S E 126	Digital Mapping	3
S E 151	Boundary Control and Legal Principles	3
I E 160	Engineering Economy	2
Pl Si 2/101	American Constitution	3
		17

SEVENTH SEMESTER		
S E 145	Geopositioning	3
S E 159	Subdivision Design	3
S E 173	Geographic Information Systems	3
Approved Elective		3
Phil 120	Contemporary Conflicts of Morals	3
Spch 3, 7, or 8		3
		18

EIGHTH SEMESTER		
S E 171	Project Design	3
S E 180	Senior Project	2
Approved Electives		9
Pl Si 120	International Politics	3
		17

COURSES

Surveying Engineering (S E)

5. Critical Reasoning (3). Fundamentals of analysis and evaluation in the context of technology. Evaluating the viewpoints of experts. Patterns of deductive and inductive arguments. Common fallacies of reasoning. General Education CORE, Critical Thinking.

10. Engineering Skills (2). Provides engineering students with experience in solving problems and presenting solutions in a logical manner, introduces students to subject areas common to most engineering disciplines and develops basic skills for solving problems through an engineering approach. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

11. Plane Surveying (2). Prerequisite: Math 5. Principles of surveying measurements; distances, directions, elevations, reduction of surveying data; planimetric mapping.

11L. Plane Surveying Laboratory (1). Prerequisite: S E 11 (or concurrently). Field practice in measurements of distance and use of level, transit, and tape in solution of practical problems. (3 lab hours; field trips required)

15. Engineering Surveying (3). Prerequisite: Math 5. Principles of surveying measurements for distance, direction and elevation. Applications to basic construction stakeout, planimetric and topographic mapping, horizontal and vertical curves, and earthwork problems.

15L. Engineering Surveying Laboratory (1). Prerequisite: S E 15 or concurrently. Field practice in surveying measurement, mapping, construction stakeout and curve alignment problems. (3 lab hours; field trips required)

16. Municipal Surveying (2). Prerequisite: S E 15. Electronic distance measurement principles; calibration and use of EDM instruments; total station and data collectors for urban control surveys and digital map data collection. Introduction to the Land Surveyors Act. Retracement surveys, certified surveys, A.L.T.A. and mortgage surveys. (Former S E 12)

16L. Municipal Surveying Laboratory (1). Prerequisite: S E 16 or concurrently. EDM and total station calibration, adjustment and use for control surveys and digital data collection. Field practice in retracement as built, lot split, certified, A.L.T.A. and mortgage surveys. (Former S E 12L)

23. Photogrammetry (2). Prerequisite: S E 11, L or 15, L; S E 23L concurrently. Theory of photographic processes, optics, lenses, emulsions, and developers. Image quality control. Characteristics of metrical photography; extraction of metrical data from single and overlapping photographs. Flight planning.

23L. Photogrammetry Laboratory (1). Prerequisite: S E 23 concurrently. Planning photography for extraction of metric data. Digital photographic measurements. Orientation and use of stereoplotters. (3 lab hours; field trips required)

34. Survey Computations (3). Prerequisite: S E 16L, Math 76, ECE 70. Probability, error theory, adjustment of simple survey nets and matrix methods; digital computer solutions of surveying computation and adjustment problems.

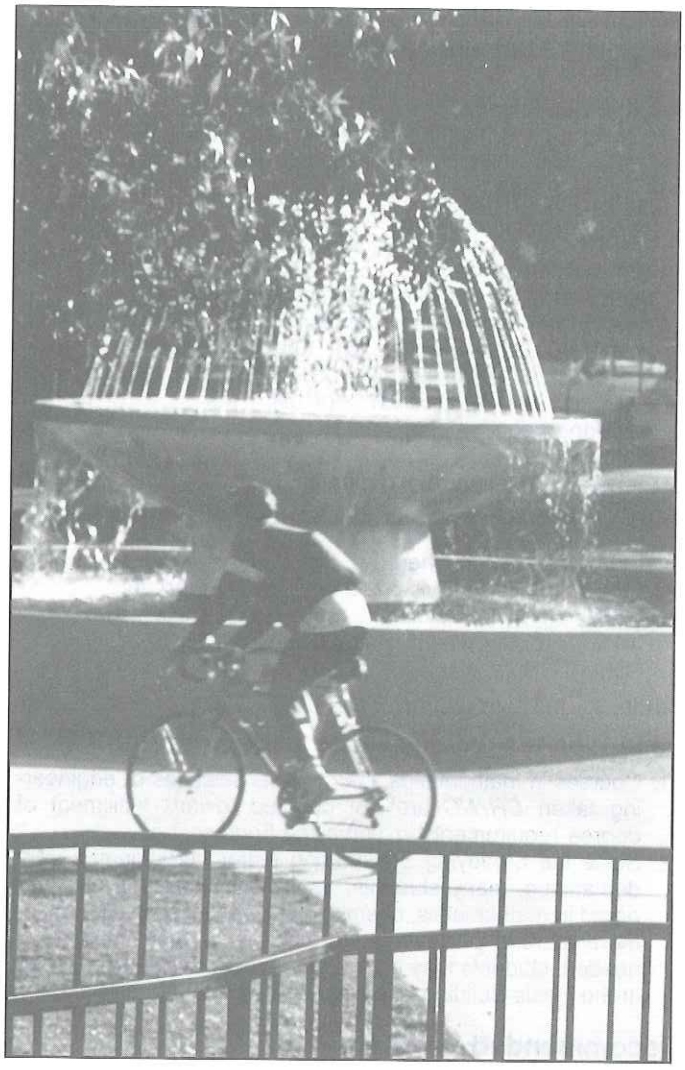
41. Route Surveying (2). Prerequisite: S E 16L. Computer programming. Computations and theory covering surveys for highway, irrigation, construction and other kinds of engineering projects. Includes computer solutions. (Field trips required)

41L. Route Surveying Laboratory (1). Prerequisite: S E 41 (or concurrently). Survey for highway location, stakeout of roads and intersections from plans. Collection of digital survey data for computer processing. (3 lab hours)

50. Land Surveying (3). Prerequisite: S E 11. Detailed study of the United States Public Land Survey System instructions with special emphasis on California. Sectionalized land subdivision, corner restoration, resurveys, evidence, descriptions. (Field trips required)

61. Microcomputers in Surveying Engineering (3). Prerequisite: Math 75 (or concurrently). Microcomputer operating systems; introduction to high level computer languages, file processing, program documentation, testing and debugging.

66. Computer Aided Mapping (3). Prerequisite: S E 61. Principles of map design and projections. Interactive editing of digital map and graphic data. Introduction to geographic information systems.



100. Technology and Society (3). Prerequisite: CORE math, Engl 1, junior standing. Technological developments and their effects on society; evaluation of technology writings; ecology and environment; future projections; selected examples.

101. Creative Thinking (3). Prerequisite: CORE math, Engl 1. Development of a process for creative thinking. Styles of thinking. Obstacles to overcome. Divergent versus convergent thinking. Idea stimulation. Gaining acceptance for new ideas.

102. Geodetic Surveying (2). Prerequisite: S E 34, 108 (or concurrently). Triangulation, trilateration, and traverse; adjustment of geodetic figures, precise leveling; astronomy for azimuth; map projections and state plane coordinates. (2 lecture hours)

102L. Geodetic Surveying Laboratory (1). Prerequisite: S E 102 (or concurrently). Field applications and practice with triangulation, trilateration, traverse, precise leveling, and astronomy for azimuth. (3 lab hours; field trips required)

105. Futuristics (3). Prerequisite: CORE math, Engl 1. Study of the future with emphasis on technology; growth curves, trend extrapolation, analytical models; breakthroughs; Delphi techniques; cross-impact matrix; flow diagrams and relevance trees; decision making.

108. Geodesy (3). Prerequisite: Math 77, permission of instructor. Size and shape of the earth; three-dimensional coordinate systems; computations on the spheroid; introduction to gravity measurements; reduction to plane coordinates.

109. Surveying Astronomy (3). Prerequisite: S E 108. Celestial sphere, star and earth coordinates; altitude and hour-angle methods of Solar observation; astronomical and instrumental corrections to observations; time systems; determination of latitude, longitude, and azimuth. (2 lecture, 3 lab hours)

121. Photographic Processes in Engineering (3). Prerequisite: Art 30. Theory of photographic processes, optics, lenses, emulsions, and developers; photographic/electronic interfacing; close-up photography; digital image processing. (2 lecture, 3 lab hours). (Former S E 21)

123. Stereo-Photogrammetry (3). Prerequisite: S E 23, 34 (or concurrently). Theory of stereo-photogrammetry; orientation of stereo-model. Design and operating principles of stereoplotters. Photogrammetric mapping; orthophoto mapping. Project planning. (2 lecture, 3 lab hours; field trips required)

125. Analytical Photogrammetry (3). Prerequisite: S E 123, 135. Introduction to analytical photogrammetry; strip and block aerial triangulation. Design and operating principles of analytical plotters. (2 lecture, 3 lab hours; field trips required)

126. Digital Mapping (3). Prerequisite: S E 66, 123. Digital map data base; structure and design; photogrammetric and land surveying data input; data processing, editing, displaying and updating. System design; hardware and software considerations. Digital terrain modeling. (2 lecture, 3 lab hours; field trips required)

135. Advanced Survey Computations (3). Prerequisite: S E 34, 102. Statistics, propagation of errors, advanced theory of least squares optimization algorithms. Computer programming for complex surveying and photogrammetry adjustment applications. Project design.

140. Earth Resources Surveying (3). Prerequisite: S E 125 (or concurrently). Extraction of quantitative data from aerial and space imagery for monitoring environment and management of earth resources. Data input for geographic information systems.

145. Geopositioning (3). Prerequisite: Phys 5B, S E 108, 135. Theory and applications of inertial surveying, satellite surveying, photogeodesy, VLBI and laser ranging, navigational aids. Processing, adjustments, project planning, and costs. (3 lecture hours; field trips required)

147. Surveying Instrumentation (3). Prerequisite: Phys 5B, S E 34. Applications of theory of optics and electronics to surveying instruments. Testing, calibration, and maintenance of modern surveying equipment. (2 lecture, 3 lab hours)

151. Boundary Control and Legal Principles (3). Prerequisite: S E 50. Legal principles that control the boundary location of real property.

152. Surveying Systems (3). Prerequisite: S E 151. Concepts of property, land tenure, land ethics; property description and recording systems; water boundary systems, tidelands, the California Coastal Act, hydrographic surveys.

153. Advanced Boundary Control (3). Prerequisite: S E 151 or permission of instructor. Complex Public Lands Surveys, analysis of fraudulent surveys; evidence collection; water boundary problems; boundary agreements; complex descriptions; case studies. (Former S E 191T section)

159. Subdivision Design (3). Prerequisite: S E 126, 151. Subdivision map act, local subdivision regulations, title search, zoning study. Tentative and final subdivision layout, map drafting, computerized subdivision design, and drafting; environmental impact study. (2 lecture, 3 hour lab; field trips required)

161. Data Collector Interfacing (3). Prerequisite: S E 61. Introduction to programming for data collectors, file system generation, manipulation, and transfer, microcomputer interface to data collector, digital theodolite, monostereo comparator, analytical plotter and digitizer/plotter.

171. Project Design (3). Prerequisite: senior standing. Design of control, boundary location and photogrammetric systems. Evaluation of design requirements, economic, and social considerations. Case Studies. (Field trips required)

173. Geographic Information Systems (3). Prerequisite S E 66 or permission of instructor. Introduction to G.I.S. Spatial data base models; raster and vector data models. G.I.S. capabilities; spatial data analysis; hardware and software considerations; generating G.I.S. products. Existing geographic and land information systems. (Field trips required) (Former S E 191T section)

180. Senior Project (2). Prerequisite: senior standing in surveying engineering; approved subject; I E 182W (or concurrently). Study of a problem under supervision of a faculty member; final typewritten report required. Individual project except by special permission.

186. Surveying Engineering Practice (1). Prerequisite: senior standing in surveying engineering. Introduction to contract law; professional registration, organizations, conduct and ethics. (Field trips required)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

191T. Topics in Surveying Engineering (1–3; max total 6). Prerequisite: permission of instructor. Investigation of selected surveying engineering subjects not in current courses.

193. Internship in Surveying Engineering (2–4; max total 4). Prerequisite: permission of adviser. Engineering practice in a consulting, industrial or government work setting. Each cooperative internship period usually spans a summer–fall or spring–summer interval. This course cannot be used to meet graduation requirements. Report will be required of the student at the termination of each implemented experience. *CR/NC* grading only.

ENGINEERING
Edwards Air Force Base Program

School of Engineering
Elden K. Shaw, Dean
Engineering East Building, Room 122
(209) 278-2603

Edwards Air Force Base
Richard C. Lathrop, Coordinator
Building 2453, Edwards A.F.B.
(805) 258-5936



California State University, Fresno in cooperation with the Air Force Flight Test Center's Education Services Branch, operates a master's degree program with options in electrical and mechanical engineering at Edwards A.F.B., CA. All coursework, examinations and degree requirements may be completed on the Base. Course credit is on-campus degree credit and may be transferred where regular degree credit is accepted, or to another CSU campus. Although sponsored by the Air Force, the program and courses are open to all qualified personnel in the area, without regard to employment affiliation. Courses are offered during off-duty hours at Desert High School, Edwards A.F.B.

Program Requirements. The program consists of a common core (12 units), a set of required courses within the option (6 units), and approved elective courses (12 units), for a total of 30 units (semester hours) of coursework. There is no requirement for a thesis. Up to nine semester hours of satisfactory graduate credit may be transferred into the program from other institutions.

The Graduate Record Examination (GRE) Aptitude Test is required of all students prior to advancement to candidate status. The Advanced Test in Engineering is *not* required. The GRE is administered several times per year at Edwards A.F.B. A GRE information booklet and application forms are available in the resident coordinator's office.

All students must complete an oral or written comprehensive examination before graduation. This examination stresses the material in the required major courses.

Faculty. All faculty are selected from the Fresno campus, from other CSU campuses and from among qualified engineers on the base.

Admission to the Program

Admission to the University. Requirements for admission to California State University, Fresno are in accordance with Title 5, Chapter 1, Subchapter 3 of the *California Code of Regulations*.

Admission to Graduate Standing. Students who apply for the program are placed in one of the following categories:

1. Graduate Standing, Classified. Students with (a) an undergraduate degree in an appropriate engineering discipline from an ABET accredited program, (b) an undergraduate grade point average of 3.0, and (c) a minimum GRE quantitative score of 450 are eligible for classified (degree status) Graduate Standing. This constitutes full admission to the graduate program.
2. Graduate Standing, Conditionally Classified. Students from non-ABET accredited engineering programs, or with degrees in physical science or mathematics or a different engineering discipline, and who have not met the requirements of category I, will be classed as Conditionally Classified Graduate Standing. Upon satisfactory completion of any noted deficiency they will then be advanced to Classified Standing.

Degree candidacy. The following requirements must be met prior to advancement to candidacy:

1. Classified graduate standing.
2. Completion at CSU, Fresno of at least 9 units of the proposed program with a 3.0 average on all completed work appearing on the program.
3. A minimum grade point average of 3.0 on all upper-division and graduate coursework from the date of embarking on the first course of the proposed master's degree program.

4. Departmental recommendation for advancement to candidacy.
5. Satisfactory completion of the Graduate Writing Skills Requirement.

Non-degree students: Students with a bachelor's degree may take graduate courses through extension (concurrent with regular students) for extension credit or audit. Prior approval of the resident coordinator is required.

Curricula

Core Courses (Common to Both Programs):

Engr 101 — Applied Engr Analysis I (3)
Engr 102 — Applied Engr Analysis II (3)
Engr 205 — Applications of Numerical Analysis (3)
Engr 210 — Linear Control Systems (3)

Mechanical Engineering Required Courses:

M E 220 — Compressible Fluids (3)
M E 230 — Aircraft Stability and Control (3)

Mechanical Engineering Electives:

Engr 212 — Advanced Control Systems (3)
M E 221 — Incompressible Fluids (3)
M E 223 — Propulsion (3)
M E 225 — Heat Transfer (3)
M E 227 — Advanced Thermodynamics (3)
M E 229 — Advanced Gas Dynamics (3)
M E 231 — Structural Dynamics (3)
M E 232 — Advanced Aircraft Stability and Control (3)
M E 290 — Independent Study (1–3)
M E 291T — Topics in Mechanical Engineering (1–3)

Electrical Engineering Required Courses:

E E 241 — Applied Electromagnetics (3)
E E 245 — Communications Engineering (3)

Electrical Engineering Electives:

Engr 212 — Advanced Control Systems (3)
E E 243 — Logic Design & Switching Theory (3)
E E 247 — Modern Semiconductor Devices (3)
E E 249 — Adv. Communications Engineering (3)
E E 251 — Antennas and Propagation (3)
E E 253 — Adv. Logic Design & Sw. Theory (3)
E E 255 — Digital Signal Processing (3)
E E 257 — Introduction to Lasers (3)
E E 259 — Radar System Design (3)
E E 290 — Independent Study (1–3)
E E 291T — Topics in Electrical Engineering (1–3)

Financial Information

Tuition and Fees. Tuition is $125* per semester hour, or $375* per three unit course. Payment is due at the time of registration and prior to the first class session. There is no provision for deferred tuition payment in state institutions. There is a one-time fee of $45* for admission to the program and a $20 graduation fee.* Tuition and fees should be paid by check or money order made out to "CSU, Fresno."

Refund Policy. Withdrawals prior to:

First Class Meeting 100%
25 percent of Course Time 65%
No Refunds Thereafter 0%

* (Fees subject to change upon approval.)

My students appreciate the fact that I have practical experience and am willing to work with them in field laboratories.

Fareed W. Nader
Professor, Civil and Surveying Engineering

Tuition Assistance. Eligible military personnel may apply for tuition assistance (T.A.) which pays 75 percent of tuition cost. The student pays the remaining 25 percent at the time of registration. Officers (but not enlisted personnel) incur a two year non-cumulative service commitment following use of T.A.

Civilian Personnel. Government civilian employees may be eligible to have tuition paid by their government agency, if it can be shown that the course content is work related. Also, many industrial firms have programs to reimburse employees for tuition paid for courses successfully completed. Contact your education development officer or training office for details.

G.I. Benefits. Eligible veterans and active duty people with more than 180 days in service may apply for educational benefits. Those with service prior to Jan. 1, 1977, receive benefits under the old G.I. Bill, which reimburses the full tuition cost. Those entering service after Jan. 1, 1977, may be eligible under the new G.I. Bill, which is a contributory plan. Application for V.A. educational benefits may be made in the office of the resident coordinator at the time of registration. V.A. forms are processed through the Fresno campus Veterans Office.

Textbooks. Textbooks normally are available from the instructor at the first class meeting. In most cases, the cost of textbooks is not reimbursed by the government. Students should be prepared to pay by check.

Enrollment and Registration

Enrollment in the Program may be accomplished in the office of the CSU, Fresno Edwards coordinator. It is not necessary to visit the Fresno campus. Students desiring to enroll should contact the Edwards coordinator for a counseling appointment. Registration for individual courses generally is accomplished during the week prior to the start of classes. Dates and times for registration are announced by flyers and in the various Base media.

For further details, contact:

Dr. Richard C. Lathrop
CSU, Fresno Resident Coordinator
Building 2453
Edwards A.F.B., CA 93523

Mailing address from on Base:

6500 ABW/MSE/CSUF
Edwards A.F.B.

Mailing Address from off Base:

P.O. Box 53
Edwards, CA 93523
Telephone: (805) 258-5936
Autovon: 527-2713

COURSES

Engineering (Engr)

101. Applied Engineering Analysis I (3). A course covering selected topics in mathematical analysis, with emphasis on applications to engineering problems. Ordinary differential equations, the LaPlace transformation, matrices and determinants, Fourier series and integrals, partial differential equations.

102. Applied Engineering Analysis II (3). A course covering selected topics in mathematical analysis with emphasis on applications to engineering problems. Vector Analysis, line and surface integrals, complex variables and integrals, conformal mapping, series, residues, potential theory, special functions, probability and statistics.

205. Computing in Engineering Analysis (3). Prerequisite: graduate status in engineering. Solution of engineering problems using digital computation. Modeling of engineering systems for numerical analysis.

210. Linear Control Systems (3). A first-year graduate course covering the analysis, synthesis, and performance of linear control systems. Partial fraction expansion, Routh's criterion, the impulse function. Basic servo characteristics and types, block diagrams, transfer functions. A detailed treatment of the root locus method for analysis and synthesis. Frequency response, logarithmic and polar plots, Nyquist's criterion, stability characteristics, phase margin and gain margin.

212. Advanced Control Systems (3). Describing function analysis of nonlinear control systems; phase-plane analysis; Liapunov stability analysis; discrete-time systems; z-transform-method; linear stochastic systems; application of statistical design principles; optimal and adaptive control systems; digital control systems.

Electrical Engineering (E E)

241. Applied Electromagnetics (3). Electrostatic field boundary conditions, energy relations, and forces; multidimensional potential problems; magnetic field boundary conditions, scalar and vector potentials, and magnetization; Maxwell's equations for stationary and moving media; energy, force, and momentum in an electromagnetic field; plane waves; waves near metallic boundaries; inhomogeneous wave equation.

243. Logic Design and Switching Theory (3). Minimum complexity combinational networks; multiple-level networks; threshold gate networks; multivalued gate networks; combinatorial network failures; minimum complexity sequential networks; asynchronous sequential networks; sequential network failures; linear and iterative networks.

245. Communications Engineering (3). Basic modulation concepts; statistical properties of signals; transmission systems optimization against noise; digital transmission and modulation methods; attenuation and phase distortion in analog and digital systems; intermodulation distortion; random multipath channels; intersystem interference.

247. Modern Semiconductor Devices (3). Crystal structures and elastic constants; lattice energy and vibrations; thermal and dielectric properties of solids; ferroelectric and magnetic properties of crystals; free electron model of metals; quantum statistics distributions; band theory; semiconductor crystals; superconductivity; photoconductivity and luminescence; dislocations.



249. Advanced Communication Engineering (3). The measure of information; noiseless coding; models of communication channels; channel capacity; discrete memoryless channels; error correcting codes; information sources; discrete channels with memory; continuous channels.

251. Antennas and Propagation (3). Wave equation, plane waves, metallic boundary conditions; wave equation for the potentials Lorentz transformation; covariant formulation of electrodynamics; radiation from a moving charge; scattering and dispersion; Hamiltonian formulation of Maxwell's equations.

253. Advanced Logic Design and Switching Theory (3). Fault detection and elimination of static and dynamic hazards in logic circuits; threshold logic systems; universal logic modules; cellular logic; multirail cascades; harmonic analysis techniques applied to logic design, programmed logic; statistics in digital design; computer-aided programming for logic design.

255. Digital Signal Processing (3). Discrete-time signals; Fourier transforms; random discrete-time signals; filtered random signals; correlation functions; power-spectral-density estimation; cross-spectral estimates; detection of signals in noise; estimation of signals in noise; recursive estimation of time-varying signals.

257. Introduction to Lasers (3). Resonant interaction of radiation and matter; anisotropic properties of media; transmission media; stimulated emission, population-inversion techniques; papamagnetic-material, gaseous-phase, and semiconductor lasers; external modulation and control; spatial and temporal coherence; fundamental measurements and measurement techniques for materials.

259. Radar System Design (3). The nature and history of radar, the radar equation, PRF and range considerations, CW and FM radars. MTI and pulse-Doppler radars, tracking radars. Radar power generation, antenna types and design considerations, receivers, detection of signals in noise, extraction of information from radar signals, propagation of radar wave, the effects of clutter, weather and interference. Examples of radar system engineering and design.

290. Independent Study (1–3; max total 6). Prerequisite: graduate status in engineering or permission of instructor. Approved for *SP* grading.

291T. Topics in Electrical Engineering (1–3; max total 6). Prerequisite: graduate status in engineering or permission of instructor. Selected electrical engineering subjects not in current courses.

Mechanical Engineering (M E)

220. Compressible Fluids (3). Review of the foundations of fluid mechanics and thermodynamics. The velocity of sound, mach number and angle, differences between incompressible, subsonic, and supersonic flow. Isentropic flow, working charts and tables, choking, operation of nozzles. Normal shock waves, ducts, shock tube analysis. Fanno and Rayleigh analysis, oblique shock waves, the Prandtl-Meyer equation. Lift and drag on bodies in supersonic flow. Method of characteristics.

221. Incompressible Fluids (3). The kinematics of liquids and gases, the La Grangian and Eulerian methods, streak lines, stream tubes. Geometry of the vector field, stokes, and Gauss's theorems, acceleration of a fluid particle, homogeneous fluids and the equation of continuity. Integration of Eutor's equation, Bernoulli's equation. Potential motion and potential functions, source and sink potentials, the stream function. Vortex theory, surfaces of discontinuity.

223. Propulsion (3). A first year graduate course covering the mechanics and thermodynamics of propulsion. Thermodynamics of fluid flow and engines, boundary layer theory, subsonic and supersonic inlets, combustors, compressors, turbines, inlet distortion, fuel controls, noise reduction, rocket propulsion. Selected topics in advanced engine technology will also be covered.

225. Heat Transfer (3). Conduction, convection, and radiation. One and two dimensional steady-state conduction, LaPlace's equation, numerical techniques. Transient heat transfer. Heisler charts, multiple-dimensional systems, boundary layers, Reynold's analogy. Forced and natural convection radiation heat transfer, Kirchoff's and Wien's laws, radiation shields.

227. Advanced Thermodynamics (3). Review of classical thermodynamics, Maxwell relations, equations of state, nonideal gases, experimental methods. The molecular theory of gases, Clausius and Van der Waals equations of state, velocity distribution. LaGrange's method, the principle of equipartition. Maxwell-Boltzmann statistics, micro and macro-states. Quantum statistics based on the Bose-Einstein, Maxwell-Boltzmann, and Fermi-Dirac statistics.

229. Advanced Gas Dynamics (3). Review of supersonic flow. Vibrational and chemical rate processes, nonequilibrium chemical rate equations, rate equations for dissociation and recombination. Flow with vibrational or chemical nonequilibrium. Nonequilibrium kinetic theory; evaluation of collision cross-sections. Flow with translational nonequilibrium. Radiative transfer in gases, and approximate solutions of the equation of radiative transfer.

230. Aircraft Stability and Control (3). A first-year graduate course covering analytical tools, system theory, reference frames, and transformations, equations of unsteady motion, longitudinal aerodynamics, lateral aerodynamics, stability of steady flight, and response to control actuation. All stability derivatives will be discussed in detail, and examples and problems based on actual airplanes will be used.

231. Structural Dynamics (3). Review of the principles of mechanics, virtual work, generalized force, potential energy, conservative systems, stability. Elastic beams and frames, plates, and shells. Von Karman theory, shear deformation, geometry and equilibrium of shells. The theory of vibrations, undamped and damped systems, orthogonality properties. Vibrations of aircraft structures, coupling with the aerodynamic equations, flutter.

232. Advanced Aircraft Stability and Control (3). Validity of small disturbance theory, nonlinear equations of motion, steady state and dynamic stability and control of elastic airplanes. Frequency response methods, response to turbulence. Automatic flight control analysis and design, the human pilot in the control loop, stability augmentation, digital flight control systems, state vector methods.

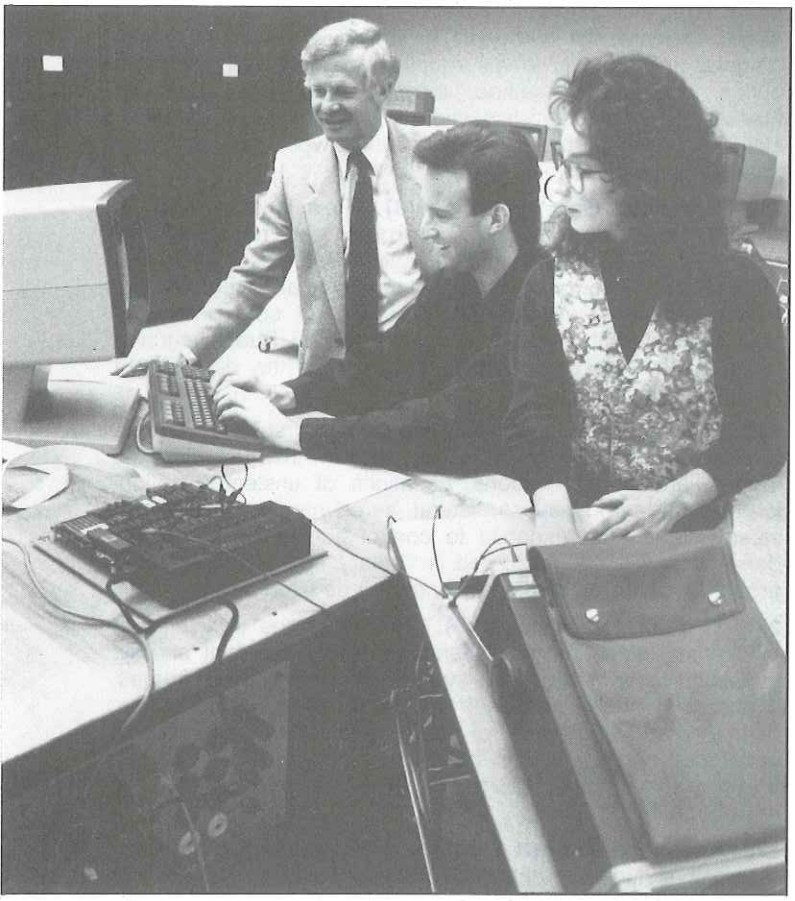
290. Independent Study (1–3; max total 6). Prerequisite: graduate status in engineering or permission of instructor. Approved for *SP* grading.

291T. Topics in Mechanical Engineering (1–3; max total 6). Prerequisite: graduate status in engineering or permission of instructor. Selected mechanical engineering subjects not in current courses.

ENGINEERING
Electrical and Computer Engineering

School of Engineering
Department of Electrical and Computer Engineering
Joseph C. Plunkett, Acting Chair
Engineering East Building, Room 218
(209) 278-2726

B.S. in Electrical Engineering
B.S. in Computer Engineering



The Department of Electrical and Computer Engineering offers a Bachelor of Science degree in Electrical Engineering and a Bachelor of Science degree in Computer Engineering. The Electrical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). As a new program, the Computer Engineering program has not yet been submitted to ABET for accreditation; plans are in place for such a submission at the appropriate time.

Electrical Engineering

The Electrical Engineering program prepares the graduate for professional practice or graduate studies in several areas of concentration. By the appropriate choice of electives, the student may emphasize the following areas of specialization:

a. Electronics and communications.
b. Computers and digital systems.
c. Power systems and energy conversion.

Electrical engineers design and develop electronic circuits, equipment and systems in the areas of *electromagnetics* (antennas; radar, radio and television systems), *communications and control* (telephone systems, satellite communications; laser and optical fiber communications; aircraft and missile guidance systems), *computers and digital systems* (computers, microprocessors and microcomputers; automated manufacturing; robots; artificial intelligence), *physical electronics and optics* (transistors; integrated circuits; optical display devices; lasers; optical fibers), *power systems and energy conversion* (hydro, thermal, nuclear, solar electric power generation; analysis and synthesis of power transmission and distribution systems; on-line power control and dispatch centers), and *bioelectronics* (sensory aids for the physically handicapped; biomedical instruments for clinical applications).

Computer Engineering

Computer Engineering is a discipline which allows the student to obtain expertise in the design, programming and applications of computers. It prepares the graduate for professional practice or graduate studies. The program combines:

a. A strong emphasis on electrical engineering (primarily electronic circuits and systems).
b. A broad basis in mathematics, physical science and general engineering.
c. Fundamentals of computer science including programming methodology, software engineering and operating systems.
d. Introductory and advanced concepts in the design of computers and computer systems.

A rich set of elective courses is available to allow the student to broaden his/her knowledge within any of several computer engineering areas.

Career Opportunities

According to a recent report by the American Electronics Association, a severe shortage of electrical and computer engineers is projected for the next several years. The explosive pace with which new developments in optical communications, microelectronics, computers, radar, microwave communications and innovative alternative energy sources are evolving should assure a solid growth pattern for electrical and computer engineers into the foreseeable future.

Organizations

Student chapters of the Institute of Electrical and Electronic Engineers and Eta Kappa Nu (the national honor society for electrical engineers) are active in the department. The Engineering School, in addition, has chapters of Tau Beta Pi, the Society of Women Engineers, the Society of Hispanic Engineers, and the Society of Black Engineers.

Co-Op Program

The department participates in the Cooperative Educational Program which allows students to integrate planned industrial experiences into their academic programs. Students interested in this program should contact the department chair of electrical and computer engineering and the campus co-op coordinator.

Faculty

Joseph C. Plunkett, *Acting Chair*

Daniel Bukofzer	Samuel Y. Liao
Rangasamy Gnanasekaran	Chung K. Liu
K. R. Gopinath	Larry D. Owens
Albert Heaney	Robert D. Regier
Robert W. Hecht	Elden K. Shaw
Medhat Ibrahim	Cheng Sun

Faculty and Facilities

The faculty, comprised of academically well-qualified engineers, have a wide range of teaching and industrial experience. Their backgrounds include significant research accomplishments, engineering teaching experience, consulting work and related engineering experience.

Excellent facilities are housed in the Engineering East Building. Modern laboratories include a microcomputer laboratory, a new CAD/CAM Laboratory, a microprocessor and digital systems laboratory, electronics laboratories, and an excellent power systems laboratory. In addition, students have access to several mini-computers, the campus mainframe computer and recently-installed Engineering Graphics workstations. A new solid state device and integrated circuits laboratory is near completion. The department has an excellent microwave and communications laboratory complete with shielded measurement rooms and r-f filters built into the walls.

Bachelor of Science Degree Requirements

Electrical Engineering Major

	Units
1. Major requirements	75
ECE 1, 71, 85, 85L, 90, 90L, 114, 116, 119, 119L, 121, 121L, 124, 126, 128, 128L, 136, 136L, 138, 138L, 155, 180	(47)
C E 21	(2)
I E 160	(2)
M E 26, 111, 136, and 31 or 116	(11)
Approved Electives	(13)
Select from the following courses and include at least one laboratory course from ECE 183A, B, C, D:	
(a) Electronics and Communications: ECE 134, 140, 144, 162, 166, 168, 171, 176, 183A, 183C.	
(b) Computers and Digital Systems: ECE 106, 107, 132, 146, 148, 172, 173, 174, 183B.	
(c) Power Systems and Energy Conversion: ECE 151, 152, 153, 183D.	
2. Additional requirements	15
Math 76, 77, 81, Math Elective (select from Math 107, 121, 124, 128, 181, or 182).	
3. Remaining General Education requirements	49
CORE: Engl 1; Spch 3, 7 or 8; Math 75; Hist 11 or 12; Pl Si 2 or 101; I E 182W	(19)
BREADTH: Chem 1A; Biol 10; Phys 5A and 5B, 3 units Division 4 (Select from Psych 61, 132, 171, H S 90, 124); Phil 10 and 120; Pl Si 120	(30)
CAPSTONE: Satisfied by Phil 120 and Pl Si 120 in BREADTH	(–)
Total	139

Notes:

1. Courses in mathematics, the physical sciences or engineering taken *CR/NC* are not counted toward fulfillment of degree requirements in Electrical Engineering.
2. Electrical Engineering majors might consider a math minor (see faculty adviser for details).
3. Since the Electrical Engineering major curriculum is very demanding, some students not fully prepared in mathematics and the physical sciences may take 4½ or more years to graduate rather than the traditional 4 years. Students not fully prepared in mathematics and/or chemistry should consider taking Math 71 and 72 in lieu of Math 75, and Chem 3A and Chem 4 in lieu of Chem 1A. If needed, students may go to the Developmental Learning Resource Center in the Keats Building and request free tutorial assistance.

Recommended Program

FIRST SEMESTER		Units
Math 75	Mathematical Analysis I	4
Chem 1A	General Chem and Qualitative Analysis	5
ECE 1	Engr Profession, Ethics and Public Policy	1
ECE 71	Engineering Computations	3
Engl 1	Composition	3
		16

SECOND SEMESTER		
Math 76	Mathematical Analysis II	4
Phys 5A	Principles of Physics I	5
Biol 10	Life Science	3
M E 26	Engineering Graphics	3
Phil 10	Self, Religion, and Society	3
		18

THIRD SEMESTER		
Math 77	Mathematical Analysis III	4
Phys 5B	Principles of Physics II	5
ECE 85,L	Digital Logic Design	4
C E 21	Statics for Electrical Engineers	2
Hist 11 or 12		3
		18

FOURTH SEMESTER		
Math 81	Applied Analysis	4
ECE 90,L	Principles of Electrical Circuits	4
ECE 116	Microprocessor Architecture and Programming	2
M E 31 or M E 116[1]		3
Pl Si 2 or 101		3
		16

FIFTH SEMESTER		
Mathematics Elective[2]		3
ECE 119,L	Principles of Computer Arch Design	3
ECE 124	Linear Electric Circuit and Sys Analysis	3
ECE 126	Electromagnetic Theory and Appl I	3
ECE 128,L	Electronics I	4
M E 111	Dynamics for Electrical Engineers	2
		18

SIXTH SEMESTER		
ECE 114	Physical Electronics	3
ECE 136,L	Electromagnetic Theory and Appl II	4
ECE 138,L	Electronics II	4
I E 182W	Engineering Writing	3
Spch 3, 7 or 8		3
		17

SEVENTH SEMESTER

ECE 121,L	Electromech Sys and Energy Conversion	4
ECE 155	Control Systems	3
I E 160	Engineering Economy	2
Approved Electives		6
Pl Si 120		3
		18

EIGHTH SEMESTER

ECE 180	Senior Project [3]	2
M E 136	Thermodynamics	3
Phil 120	Contemporary Conflicts of Morals	3
Approved Electives		7
Div 4 Elective [4]		3
		18

[1] M E 116 is for students in power option.
[2] Mathematics Electives: Select from Math 107, 121, 124, 128, 181, or 182.
[3] With approval by the student's academic adviser and the department chair, approved electives may be substituted for ECE 180, Senior Project.
[4] Select from Psych 61, 132, 171; H S 90, 124.

Bachelor of Science Degree Requirements
Computer Engineering Major

	Units
1. Major core requirements	53
ECE 1, 85, 85L, 114, 116, 119, 119L, 124, 128, 128L, 180	(22)
Computer Design Option requirements	
ECE 174, 183B	(4)
C Sci 144, 150	(6)
Approved Area Design Electives	(9)
Approved Electives	(12)
Approved Area Design Elective Courses	
ECE 106, 107, 132, 148	
Approved Electives	
ECE 134, 138, 138L, 140, 146, 155, 172, 176	
2. Fundamental Engineering requirements	10
C E 21, M E 111	(4)
ECE 90, 90L	(4)
I E 160	(2)
3. Additional requirements	26
C Sci 40, 41	(8)
Math 14, 76, 77, 81, 107	(18)
4. Remaining General Education requirements	49
CORE: Engl 1; Spch 3, 7, or 8; Math 75; Hist 11 or 12; Pl Si 2; I E 182W	(19)
BREADTH: Chem 1A; Phys 5A and 5B; Biol 10; 3 units Division 4 (Select from Psych 61, 132, 171, H S 90, 124); Phil 10 and 120; Pl Si 120	(30)
CAPSTONE: (double counted with BREADTH) are: Phil 120, Pl Si 120	(–)
Total	138

Notes:

1. Courses in mathematics, the physical sciences or engineering taken *CR/NC* are not counted toward fulfillment of degree requirements in Computer Engineering.
2. Computer Engineering majors might consider a math minor. (See faculty adviser for details.)
3. Since the Computer Engineering major curriculum is very demanding, some students not fully prepared in mathematics and the physical sciences may take more than the traditional 4 years to graduate. Students not fully prepared in mathematics and/or chemistry should consider taking Math 71 and 72 in lieu of Math 75, and Chem 3A and 4 in lieu of Chem 1A. If needed, students also may go to the Developmental Learning Resource Center in the Keats Building and request free tutorial assistance.

Recommended Program

FIRST SEMESTER

		Units
Math 75	Mathematical Analysis I	4
Chem 1A	General Chem and Qualitative Analysis	5
ECE 1	Engr Profession, Ethics and Public Policy	1
Engl 1	Composition	3
C Sci 40	Computer Programming	4
		17

SECOND SEMESTER

Math 76	Mathematical Analysis II	4
Phys 5A	Principles of Physics I	5
Math 14	Intro to Discrete Structures	3
C Sci 41	Intro to Data Structures	4
		16

THIRD SEMESTER

Math 77	Mathematical Analysis III	4
Phys 5B	Principles of Physics II	5
ECE 85,L	Digital Logic Design	4
Phil 10	Self, Religion and Society	3
C E 21	Statics for Electrical Engineers	2
		18

FOURTH SEMESTER

Math 81	Applied Analysis	4
ECE 90,L	Principles of Electrical Circuits	4
ECE 116	Microprocessor Arch and Programming	2
C Sci 150	Intro to Software Engineering	3
Pl Si 2	American Government and Institutions	3
M E 111	Dynamics for Electrical Engineers	2
		18

FIFTH SEMESTER

I E 182W	Engineering Writing	3
Math 107	Intro to Prob and Statistics	3
ECE 124	Linear Electric Circ and Systems Analysis	3
ECE 128,L	Electronics I	4
ECE 119,L	Principles of Computer Arch Design	3
I E 160	Engineering Economics	2
		18

SIXTH SEMESTER

ECE 174	Advanced Computer Architecture	3
Biol 10	Life Science	3
C Sci 144	Intro to Operating Systems	3
Hist 11 or 12		3
Approved Area Electives [3]		6
		18

SEVENTH SEMESTER

ECE 114	Physical Electronics	3
ECE 183B	Digital Devices and Systems Lab	1
Phil 120	Contemporary Conflicts of Morals	3
Spch 3, 7 or 8		3
Approved Electives [2]		3
Approved Area Electives [3]		3
		16

EIGHTH SEMESTER

ECE 180	Senior Project	2
PI Si 120	International Politics	3
Division 4 Elective [1]		3
Approved Electives [2]		9
		17

[1] Select from Psych 61, 132, 171; H S 90, 124.
[2] Students should select at least 12 units from the list of Approved Electives or from the list of Computer Design Area Electives.
[3] Students should select at least 9 units from the list of approved Computer Design Area Electives.

COURSES

Electrical and Computer Engineering (ECE)

Students may be expected to purchase supplementary materials for senior projects and special topic laboratory and activity classes.

1. Engineering Profession, Ethics and Public Policy (1). The electrical engineering profession and its career opportunities; engineering professionalism and ethics; ethics case studies, engineering code of ethics; introduction to engineering problem solving. (Former E E 1)

70. FORTRAN 77 Programming (2). Prerequisite: algebra, trigonometry. Flow-charting, program structure, computation and arithmetic functions, input-output, transfer of control, looping, subscripted variables, subprograms, file processing, printer plotting techniques, terminal and batch processing procedures. General Education CORE, Quantitative Reasoning. (Former E E 70)

71. Engineering Computations (3). Prerequisite: algebra, trigonometry. Use of Pascal and Fortran 77 in engineering analysis and/or design. A systematic development in program structure, specification, documentation, testing and debugging. Cannot be taken for credit if ECE 70 has been taken previously. General Education CORE, Quantitative Reasoning. (Former E E 71)

85. Digital Logic Design (3). Prerequisite: Phys 5B (or concurrently). Boolean algebra. Logic gates, number systems, combinatorial logic, minimization techniques. Design of combinatorial circuits using SSI and MSI. Flipflops, multivibrators and counters. Introduction to sequential circuits and state machines. Synchronous state machine design. Mealey and Moore models. (Former E E 85)

85L. Digital Logic Design Laboratory (1). Prerequisite: ECE 85 (concurrently). Usage, design and implementation techniques for SSI, MSI realization of combinatorial and sequential circuits. Experiments utilizing logic gates, Karnaugh maps, multiplexers, demultiplexers, latches, flipflops, counters and shift registers. Sequential state machine design. (Former E E 85L)

90. Principles of Electrical Circuits (3). Prerequisite: ECE 70 or 71; Phys 5B; Math 81 (or concurrently). Direct-current circuit analysis; circuit theorems; transient phenomena in RLC circuits; phasor concept; sinusoidal steady-state response; power and RMS calculations in single-phase and polyphase alternating-current circuits; principles of electrical instruments; computer solutions. (Former E E 90)

90L. Principles of Electrical Circuits Laboratory (1). Prerequisite: ECE 90 (or concurrently). Experiments on direct- and alternating-current circuits, including single-phase and polyphase systems. Use of electrical instruments, development of laboratory techniques, and verification of basic principles. (3 lab hours) (Former E E 90L)

106. Switching Theory and Logical Design (3). Prerequisite: ECE 85 or equivalent. Quine-McCluskey minimization; switching functions; finite and non-finite state machines; state assigments; synchronous and asynchronous machines; incompletely specified sequential circuits; pulse-mode circuits. (Former E E 106)

107. Digital Signal Processing (3). Prerequisite: ECE 71, 85, 124. Data acquisition by computers, numerical evaluation of Fourier transforms, A/D and D/A conversion, digital filter design, programming, and emulation of a popular digital signal processor. (Former E E 107)

114. Physical Electronics (3). Prerequisite: Phys 5B. Electronic structure of metals, semiconductors and insulators; energy band structure, modern semiconductor devices such as p-n junction semiconductors, bipolar and field-effect transistors, integrated and optoelectronic devices. (Former E E 114)

116. Microprocessor Architecture and Programming (2). Prerequisite: ECE 71, 85. Architecture and programming models of a microprocessor. Assembly Language program specification, development, testing and documentation. (Former E E 116)

119. Principles of Computer Architecture (2). Prerequisite: ECE 85, 116. Structural organization, hardware architecture and design of digital computer systems; number systems and binary representation of data and binary arithmetic; hardware/software design tradeoffs; comparisons of computer architectures. Introduction to microcomputers. (Former E E 133, 119)

119L. Principles of Computer Architecture Design Laboratory (1). Prerequisite: ECE 119 (concurrently). Experiments on computer architecture and peripheral equipment; laboratory synthesis of combination and sequential logic circuits for interfacing. (Former E E 133, 119L)

121. Electromechanical Systems and Energy Conversion (3). Prerequisite: ECE 90, 90L. Principles of direct- and alternating-current machinery and other energy-conversion devices and associated apparatus. (Former E E 121)

121L. Electromechanical Systems and Energy Conversion Laboratory (1). Prerequisite: ECE 121 (concurrently). Experiments and computations on direct- and alternating-current machinery and on other energy-conversion devices and associated apparatus. (3 lab hours) (Former E E 121L)

124. Linear Electric Circuit and Systems Analysis (3). Prerequisite: ECE 90, 90L. Operational analysis of discrete and continuous linear circuits and systems: Z-transforms, Laplace and Fourier transforms; Fourier series; state-space representations, computer-aided solutions. (Former E E 124)

126. Electromagnetic Theory and Applications I (3). Prerequisite: ECE 90 (or concurrently). Electrostatics; boundary value problems; magnetostatics; time-varying fields; Maxwell's equations. (Former E E 126)

128. Electronics I (3). Prerequisite: ECE 90 (or concurrently). Characteristics and properties of solid state devices; theory and analysis of electronic circuits; power supply design; device and circuit models; single and multi-stage amplifier analysis and design; feedback amplifiers; computer solutions as appropriate. (Former E E 128)

128L. Electronics I Laboratory (1). Prerequisite: ECE 128 (or concurrently). Experiments on static and dynamic characteristics of solid state devices and electronic circuits; computer solutions as appropriate. (3 lab hours) (Former E E 128L)

132. Design of Digital Systems (3). Prerequisite: ECE 116, 119. Design of Digital Systems utilizing microprocessors; application of assembly programming language to input/output programming, interrupts and traps, DMA and memory management. (Former E E 132)

134. Communication Engineering (3). Prerequisite: ECE 124. Mathematical modeling of signals and noise; information theory; analog and digital communication theory; radar and satellite system and link design; system noise temperature modeling; project design to pre-established specifications. (Former E E 134)

136. Electromagnetic Theory and Applications II (3). Prerequisite: ECE 126. Plane wave propagation and reflection; transmission of electromagnetic energy over wires at power and communication frequencies; waveguide; antenna analysis and design; methods for computer solution. (Former E E 136)

136L. Electromagnetic Theory and Applications Laboratory (1). ECE 136 concurrently. Experiments on the transmission of electromagnetic energy through wires, wave guides, and space; filters and antennas; impedance matching; cross-over networks; location of faults on lines. (3 lab hours) (Former E E 136L)

138. Electronics II (3). Prerequisite: ECE 124, 128, 128L. Analysis and design of high frequency and power amplifiers; dc and operational amplifiers; LC and crystal oscillators, modulators and demodulators for communications; active filters. Emphasis on modern design methods including applications of active integrated circuits. (Former E E 138)

138L. Electronics II Laboratory (1). ECE 138 concurrently. Design oriented experiments to study the characteristics, limitations, and design tradeoffs of circuits from ECE 138. Emphasis on circuit and system design to meet pre-established specifications. Design project included; computer solutions as appropriate. (3 lab hours) (Former E E 138L)

140. VLSI Circuit and System Design (3). Prerequisite: ECE 85, 114, 124 (or concurrently), 128, 128L. Design and analysis of LSI/VLSI chips, circuits, and systems; logic and mask designs for bipolar, MOS, and CMOS logic families; ROM and RAM memories; CAD/CAM, full-custom, and semi-custom design approaches; IC layout rules. (Former E E 140)

144. Integrated Circuit Design and Fabrication (3). Prerequisite: ECE 114. Diffusion and ion implantation processes in silicon device fabrication; the planar process; CVD methodology in GaAs devices; design layout rules; impurity profile shaping, measurement, and its relationship to device performance; laboratory measurement and characterization techniques for IC's; laboratory demonstrations. (Former E E 144)

146. Computer Networking and Distributed Processing (3). Prerequisite: ECE 116, 119. Analysis and design of modern computer networks. Topics to be introduced include routing, flow and congestion control, packet, message and circuit switching, and recovery. Examples of current implemented networks and network architectures. (Former E E 146)

148. Analysis and Design of Digital Circuits (3). Prerequisite: ECE 85, 128. Analysis and design of solid state digital circuits utilizing various logic families suitable for integration (TTL, ECL, NMOS, CMOS, etc): logic gates; multivibrators; ROM, PROM, and EPROM; SRAM and DRAM; PLDs, Gate Arrays and other ASICs. (Former E E 148)



151. Electrical Power Systems (3). Prerequisite: ECE 121, 121L (or concurrently). Power system networks and equipment, steady-state operation, short-circuit analysis, power system stability analysis by digital computation, synchronous generator excitation and governor systems, system load representation, numerical analysis techniques. (Former E E 151)

152. Symmetrical Components and Short Circuit Analysis (3). Prerequisite: ECE 121, 121L (or concurrently). Theory of symmetrical components and their use in power systems analysis; sequence impedances of system components; applications in fault calculations. (Former E E 152)

153. Power Electronics (3). Prerequisite: ECE 121, 128. Characteristics, limitations and circuit applications of power semiconductor devices; diode and phase controlled rectifier; DC-to-DC converters; DC-to-AC inverters; switching DC power supplies; power conditioners; uninterruptible power supplies; practical aspects of converter design. (Former E E 153)

155. Control Systems (3). Prerequisite: ECE 124. Analysis, design, and synthesis of linear control systems; modeling, performance evaluation, frequency response, and stability. (Former E E 155)

162. Analog Integrated Circuits and Applications (3). Prerequisite: ECE 138. Analysis of monolithic operational amplifiers; case studies; Widlar and Wilson current sources; linear and nonlinear applications; multipliers, phase-lock loops, phase detectors; higher order active filters; all-pass equalizers; D/A and A/D converters; oscillators, function generators; mixers, modulators, regulators; system design. (Former E E 162)

166. Microwave Devices and Circuits Design (3). Prerequisite: ECE 136. Microwave theory and techniques: slow-wave structures, S parameters, and microwave devices including klystrons, reflex klystrons, traveling-wave tubes, magnetrons and gyrotrons. (Former E E 166)

168. Microwave Amplifier and Oscillator Design (3). Prerequisite: ECE 136. Small-signal and large-signal amplifier designs such as high-gain, high-power, low-noise, narrowband and broadband amplifiers; microwave oscillator designs such as high-power, broadband, Gunn-diode and IMPATT oscillator designs; power combining and dividing techniques; reflection amplifier design and microwave measurements. (Former E E 191T section, 168)

171. Quantum Electronics (3). Prerequisite: ECE 126. Review of wave properties; cavity mode theory; radiation laws; theory and morphology of lasers; laser and fiber-optic communications; designs of optical communication systems and components. (Former E E 171)

172. Sequential Machine and Automata Theory (3). Prerequisite: ECE 106. Structure of sequential machines; covers; partitions; decompositions, and synthesis of multiple machines. State identification and fault detection experiments; memory characteristics of finite automata. (Former E E 172)

173. Digital Controls and Robotics (3). Prerequisite: ECE 85, 121, 124. Introduction to digital controls; development and classification of robots; components and operation of robots, types of sensors; vision sensors; artificial intelligence; classroom demonstrations and practice with a robot. (Former E E 173)

174. Advanced Computer Architecture (3). Prerequisite: ECE 119. Advanced computing architecture concepts: pipelining, coprocessing and multiprocessing; analysis and design of cache and virtual memory systems; direct memory access, local and system bus architectures; instruction set design and coding; EDAC. (Former E E 120, 174)

176. Computer-Aided Circuit Design (3). Prerequisite: ECE 124, 128, 128L. Computer simulation of analog circuits. Computer-aided engineering of digital circuits including schematic capture and logic simulation. Computer-aided design of application specific integrated circuits including programmable logic devices, gate arrays and standard cell devices. (Former E E 176)

180. Senior Project (2). Prerequisite: senior standing in electrical and computer engineering, I E 182W (or concurrently), approved subject. Study of a problem under supervision of faculty member; final typewritten report required. (Individual project except by special permission) (Former E E 180)

183A. Electronic Circuits and Electrical Networks Laboratory (1). Prerequisite: ECE 124, 138, 138L. Signal measurement and analysis techniques for communication networks; discrete, hybrid, and integrated electronic circuit design and testing; analog and digital filter realization; computer-aided analysis and design of circuits and networks. (3 lab hours) (Former E E 183A)

183B. Digital Devices and Systems Laboratory (1). Prerequisite: ECE 85, 128. Familiarization with a real-time microcomputer board, assembly language programming techniques, I/O interfacing, documentation, debugging and testing. (3 lab hours) (Former E E 183B)

183C. Physical Electronics and Electromagnetics Laboratory (1). Prerequisite: ECE 114, 128, 128L, 136, 136L. Solid state device and characterization; rf component design with stripline and microstrip techniques; electromagnetic signal analysis; noise reduction techniques; antenna pattern measurements; laser system design. (3 lab hours) (Former E E 183C)

183D. Electrical Power and Control Systems Laboratory (1). Prerequisite: ECE 121, 121L, 155 (or concurrently). Measurement of characteristics and testing of power systems, computer-aided design and simulation of power and control systems; design and testing of feedback control systems; parametric study of control system implementation. (3 lab hours) (Former E E 183D)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading. (Former E E 190)

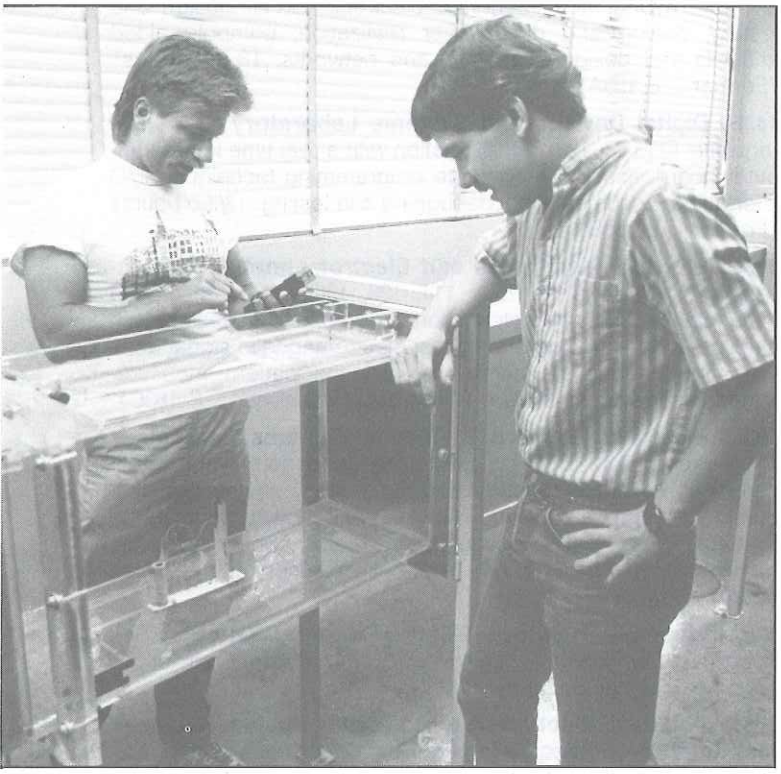
191T. Topics in Electrical and Computer Engineering (1–3; max total 6). Prerequisite: permission of instructor. Investigation of selected electrical engineering subjects not in current courses. (Former E E 191T)

193. Electrical and Computer Engineering Cooperative Internship (3–4). Prerequisite: permission of adviser. Engineering practice in an industrial or governmental installation over a period of about seven months duration. Each period must span a summer–fall or spring–summer interval. This course cannot be used to meet graduation requirements. *CR/NC* grading only. (Former E E 193)

ENGINEERING
Mechanical and Industrial Engineering

School of Engineering
Department of Mechanical and Industrial Engineering
Delbert E. Robison, Chair
Engineering West Building, Room 108
(209) 278-2368

B.S. in Mechanical Engineering
B.S. in Industrial Engineering



The Department of Mechanical and Industrial Engineering offers a Bachelor of Science degree in engineering (mechanical engineering or industrial engineering major). Both of these programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

The objectives of the Mechanical and Industrial Engineering programs are: (1) to provide qualified students the opportunity to acquire quality education in either the mechanical or industrial engineering options of sufficient depth and breadth that upon graduating with a bachelor's degree in either option, the student can enter a profession in industry or government as a qualified engineer capable of making independent contributions with a minimum of supervision, or can enter a graduate program in engineering at a university of his/her choice without qualification other than the general admission requirements; (2) to provide opportunities for reentry of practicing engineers to enroll in refresher courses or for non-engineering graduates to earn a second degree; (3) to provide the graduate with sufficient general education that he/she can take his/her place in the community as a responsible citizen, sensitive to community needs, and capable of providing leadership in community affairs; (4) to provide the graduate with the technical background, self-assurance, and motivation to continue life-long learning and self-development in the engineering profession, the physical and social sciences, and the humanities.

Faculty and Facilities

The mechanical and industrial engineering curricula are designed to give the student a firm understanding of the applications and practice as well as the principles and science of engineering. In addition to high academic qualifications, most of the faculty have had distinguished careers in industry and are able to help the student develop self-confidence as well as professional skill in defining and solving engineering problems.

Laboratory courses that emphasize the operation and use of instruments and the experimental approach are required in the mechanical and industrial engineering curricula. The department has laboratories equipped with electronic data acquisition systems and test apparatus which enable engineering students to study the effects of different parameters on the operation and performance of energy, fluid-flow, air-conditioning, and heat-power systems.

Industrial engineering students gain valuable practical experience through laboratories and cooperative industrial projects. State-of-the-art computer systems in conjunction with advanced robotic equipment are used in an engineering laboratory environment to enrich the industrial engineering students' learning experience. Laboratory courses emphasize such subjects as computer assisted manufacturing, computer assisted design, material handling, plant layout, and human factors engineering. Students gain additional practical experience by using the facilities and equipment of local industries in association with cooperative engineering projects.

The faculty recognize the importance of the use of computers for design and manufacturing and have developed courses for the instruction of computer aided engineering.

Career Opportunities

The career outlook for engineers is very favorable at this time and is expected to continue into the indefinite future. Mechanical and industrial engineers are highly sought by the high-technology industries because of their technical versatility and adaptability to a broad range of engineering activities. Opportunities exist in aerospace, conventional and alternative-energy power production, manufacturing and fabrication, machine and tool design, public transportation systems, electronics, and a host of other industries which rely on engineers for concept formulation, component and systems design, and technical management.

Faculty

Delbert E. Robison, *Chair*

Joseph R. Battenburg
Shyhming Chang
Zbigniew J. Czajkiewicz
Karen L. Frair
Lester C. Frair
McRae Jarrett
Dennis C. Kuzma
Hamo Lalehzarian
Walter V. Loscutoff
Prakash T. Mahajan
Satya D. Mahanty
James D. Matheny
William W. Peng

Mechanical Engineering Program

Mechanical engineering has two major stems, energy and machine design. Both embody application of the physical sciences and technology in their research, production, operation, organization, and economic aspects to the design and development of processes, machines, systems, and facilities. The energy disciplines focus on the conversion of energy primarily in chemical, thermal, or mechanical form for the production, transmission, and utilization of power. Machine design focuses on the material, applied mechanics, mechanism, structural, and manufacturing aspects of producing tools, machinery, and other manufactured goods.

Mechanical engineers are especially concerned with the thermal, fluid flow, and energy conversion processes connected with the production of power from fossil and nuclear fuels, and from solar, biomass, and other alternative-energy sources . . . with heating, ventilation, refrigeration, cryogenic, and environmental systems for the control of humidity, temperature, and air cleanliness . . . with propulsion and vehicles for land, water, and space transportation, including space vehicles, air-cushion and hydrofoil vehicles, tractors, trucks, and high-speed magnetically powered trains . . . with power components such as internal combustion engines, gas and steam turbines, rockets, turbojets, and fuel cells . . . with fluid-flow machinery such as pumps, fans, blowers, compressors, and valves . . . and with material handling and food processing equipment including hydraulic lifts, machine tools, and mechanical, pneumatic, and hydraulic conveyor systems.

Bachelor of Science Degree Requirements

Mechanical Engineering Major

Units

1. Major requirements 76
   - M E 26, 31, 112, 116, 117, 118, 131, 131L, 134, 136, 140, 144, 154, 155, 156, 157, 164, 166 ..... (46)
   - C E 20, 121 ..... (6)
   - ECE 70, 90, 90L, 121, 121L ..... (10)
   - I E 160, 161 ..... (4)
   - Approved Electives ..... (10)
     - Select at least 5 units from Group A and 5 units from Group B.
     - Group A (Engineering Science): I E 110; M E 137, 142, 145, 146, 147.
     - Group B (Design): M E 143, 162, 180.
2. Additional requirements
   - Math 76, 77, 81 12
3. Remaining General Education requirements 50
   - CORE: Engl 1; Spch 3, 7, or 8; Math 75; Hist 11 or 12; Pl Si 2 or 101; I E 182W ..... (19)
   - BREADTH: Chem 1A; Phys 5A and 5B; Div 2 (Bio. Proc.), 3 units; Art 13 or I E 125; Phil 1, 120; Pl Si 120 ..... (31)
   - CAPSTONE: Satisfied by Phil 120 and Pl Si 120 in BREADTH ..... (–)

   Total 138

Notes:

1. Courses in mathematics, the physical sciences or engineering taken *CR/NC* are not counted toward fulfillment of degree requirements in Mechanical Engineering.
2. Mechanical engineering majors might consider a math, physics or business minor.
3. Since the mechanical engineering major curriculum is very demanding, many students, especially those not fully prepared in mathematics, chemistry and/or physics, take 4½ or more years to graduate rather than the traditional 4 years. Students not fully prepared in mathematics and/or chemistry should consider taking Math 71 and 72 in lieu of Math 75, and Chem 3A and 4 in lieu of Chem 1A. If needed, students also may go to the Developmental Learning Resource Center in the Keats Building and request free tutorial assistance.

Recommended Program

FIRST SEMESTER		*Units*
ECE 70	FORTRAN 77 Programming	2
Chem 1A	General Chem and Qual Analysis	5
Engl 1	Composition	3
Math 75	Mathematical Analysis I	4
Art 13/I E 125		3
		17

SECOND SEMESTER		
M E 26	Engineering Graphics	3
Math 76	Mathematical Analysis II	4
Phys 5A	Principles of Physics I	5
Biological Processes [1]		3
		15

THIRD SEMESTER		
M E 31	Engineering Materials	3
Hist 11/12	American History	3
Math 77	Mathematical Analysis III	4
Phys 5B	Principles of Physics II	5
Speech 3, 7, or 8		3
		18

FOURTH SEMESTER		
C E 20	Engineering Mehanics: Statics	3
ECE 90, L	Principles of Electrical Circuits	4
Math 81	Applied Analysis	4
Phil 1	Introduction to Philosophy [2]	4
Pl Sci 2/101	Amer. Const., Instit. and Ideals	3
		18

FIFTH SEMESTER		
M E 112	Engineering Mechanics: Dynamics	3
M E 136	Thermodynamics	3
M E 140	Advanced Engineering Analysis	3
C E 121	Mechanics of Materials	3
I E 182W	Engineering Writing	3
Pl Si 120	International Politics	3
		18

SIXTH SEMESTER

M E 116	Fluid Mechanics	3
M E 117	Instrumentation Lab	1
M E 131, L	Advanced Engineering Materials	3
M E 134	Dynamics in Machine Design	3
M E 144	Advanced Mechanics of Materials	3
ECE 121, L	Electro. Systems and Energy Conv.	4
		17

SEVENTH SEMESTER

M E 118	Fluid Mechanics Lab	1
M E 154	Design of Machine Elements	3
M E 155	Elements of Systems Design	3
M E 156	Adv Thermo-Fluid Mechanics	3
I E 160	Engineering Economy	2
Approved Electives [3]		5
		17

EIGHTH SEMESTER

M E 157	Adv Thermo-Fluid Mechanics Lab	2
M E 164	Machine Design	3
M E 166	Energy Systems Design	3
I E 161	Legal Aspects of Engineering	2
Phil 120	Cont. Conflicts in Morals	3
Approved Electives [3]		5
		18

[1] Any three unit course from Division 2.
[2] Phil 10 plus 1 unit of Phil 192, Directed Reading, are acceptable.
[3] Approved Electives: Select at least 5 units from Group A and 5 units from Group B.

COURSES

Mechanical Engineering (M E)

10. Engineering Skills (2). Provides engineering students with experience in solving problems and presenting solutions in a logical manner, introduces students to subject areas common to most engineering disciplines and develops basic skills for solving problems through an engineering approach. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

26. Engineering Graphics (3). Prerequisite (or concurrently): Math 75, ECE 70. Principles of orthographic projection, dimensioning, and descriptive geometry. Applications to the solution of engineering problems including the use of interactive computer graphics. (2–3-hour lecture labs) (CAN ENGR 2)

31. Engineering Materials (3). Prerequisite (or concurrently): Chem 1A, Phys 5A. Fundamental nature and properties of engineering materials; structure of matter and its effect on mechanical, electrical, magnetic, and thermal properties. (CAN ENGR 4)

111. Dynamics for Electrical Engineers (2). Open to Electrical Engineering majors only. Prerequisite: C E 20 or 21. Kinematics and kinetics of a particle and rigid body in general plane motion. Introduction to mechanical vibration and linear system analysis.

112. Engineering Mechanics: Dynamics (3). Prerequisite: C E 20. Development of principles of kinematics and kinetics in engineering.

116. Fluid Mechanics (3). Prerequisite: Chem 1A, M E 112 (or concurrently). Fundamentals of fluid mechanics as applied to engineering problems.

117. Instrumentation Laboratory (1). Prerequisite: ECE 70, I E 182W, M E 116 (or concurrently). Study of instrumentation and experimental methods; applications; fluid mechanics laboratory; computer-aided data acquisition. (One-hour lab)

118. Fluid Mechanics Laboratory (1). Prerequisite: I E 182W, M E 116 (or concurrently). Applications of experimental methods used in engineering practice to fluid systems. (One 3-hour lab) (Former M E 116L)

131. Advanced Engineering Materials (2). Prerequisite: M E 31, C E 121. Applications of the principles of materials science to the study of the mechanical behavior of metallic, polymeric, ceramic, and composite materials. Effects of stress and environmental variables.

131L. Advanced Engineering Materials Laboratory (1). Prerequisite: I E 182W, M E 131 (or concurrently). Application of experimental methods related to mechanical metallurgy; study of strengthening mechanisms in metals; fatigue; creep; recrystallization. (3 lab hours)

134. Dynamics in Machine Design (3). Prerequisite: M E 26, 112, C E 121 (or concurrently); Math 81. Analytical, graphical and computer solutions to design problems in machinery. Mechanisms, static and dynamic forces, gearing. Both closed- and open-ended homework problems. (2 lecture, 3 lab hours)

136. Thermodynamics (3). Prerequisite: Chem 1A, M E 112 (or concurrently). Fundamentals of thermodynamics and heat transfer as applied to engineering problems.

137. Turbomachinery (3). Prerequisite: M E 117, 118, and 136. Applications of fluid mechanics and thermodynamics and rotor-fluid energy interchange. Steady flow problems of pumps, compressors, and turbines with incompressible and compressible fluids. Both closed- and open-ended homework problems.

140. Mechanical Engineering Analysis (3). Prerequisite: Math 81, ECE 70, M E 112 (or concurrently), and M E 136 (or concurrently). Development of the finite element method of engineering analysis; specific applications to heat flow, fluid flow, vibrations in mechanical systems, and stresses in mechanical component design using appropriate numerical techniques, closed-form solutions of partial differential equations and the digital computer.

142. Mechanical Vibration (3). Prerequisite: M E 112, C E 121. Mathematical and physical basis of vibration theory with applications to engineering; design; transient and steady state phenomena; distributed and lumped parameters; coupled systems; computer solutions.

143. Mechanical Design Laboratory (2). Prerequisite: C E 121, I E 182W, M E 134. Application of theory and techniques of experimental stress analysis to the design of mechanical structures. Designing and testing a mechanical device or structure and the submittal of a technical report of the results. (1 lecture, 3 lab hours)

144. Advanced Mechanics of Materials (3). Prerequisite: C E 121, ECE 70, Math 81. Advanced topics in mechanics of materials.

145. Heat and Mass Transfer (3). Prerequisite: ECE 70, Math 81, M E 116, 136. Analytical, numerical, and electrical analogy methods are used to solve a variety of heat transfer and mass transfer problems. Advanced topics in radiation, boundary layer flow, and heat exchanger design.

146. Air Conditioning (3). Prerequisite: M E 116, 136. Theory and practice in air conditioning including psychrometrics, load estimating, heating and cooling systems, fluid design and controls.

147. Air Conditioning Laboratory (1). Prerequisite: I E 182W, M E 146 (or concurrently). Practical laboratory work with commercial type units; test of components of air conditioning systems. (3 lab hours) (Former M E 146L)

154. Design of Machine Elements (3). Prerequisite: M E 134, 144. Application of theory and practice to the design of machine elements and components. Individual and team-type open-ended design projects with classroom discussion of the principles involved in the designs. The use of Engineering's computers to solve complex problems is encouraged. (2 lecture, 3 lab hours)

155. Elements of Systems Design (3). Prerequisite: M E 134, Senior Standing. Introduction to the concepts and practice of the design of engineering systems. Students are required to complete preliminary designs of specified engineering systems. Experience in design is gained through setting specifications, innovation, design optimization, and social and economic aspects.

156. Advanced Thermodynamics — Fluid Mechanics (3). Prerequisite: M E 116, 136. Advanced topics in thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

157. Advanced Thermodynamics — Fluid Mechanics Laboratory (2). Prerequisite: M E 117, 118, 156 (or concurrently). Applications of advanced experimental methods used in engineering practice to thermo-fluid systems. (One 1-hour lecture; one 3-hour lab)

162. Computer-Aided Design and Manufacturing (3). Prerequisite: M E 140. Application of the computer for designing, machining, inspecting, assembling, and performance simulation of mechanical components and systems. Topics include computer graphics, design/optimization, CNC programming/machining, and computer data acquisition and control.

164. Machine Design (3). Prerequisite: M E 116, 136, 154; I E 182W, 160 (or concurrently). Open-ended design problems with related theory as needed. This course integrates the material of the prerequisite courses into final designs. (Two 3-hour lecture-labs)

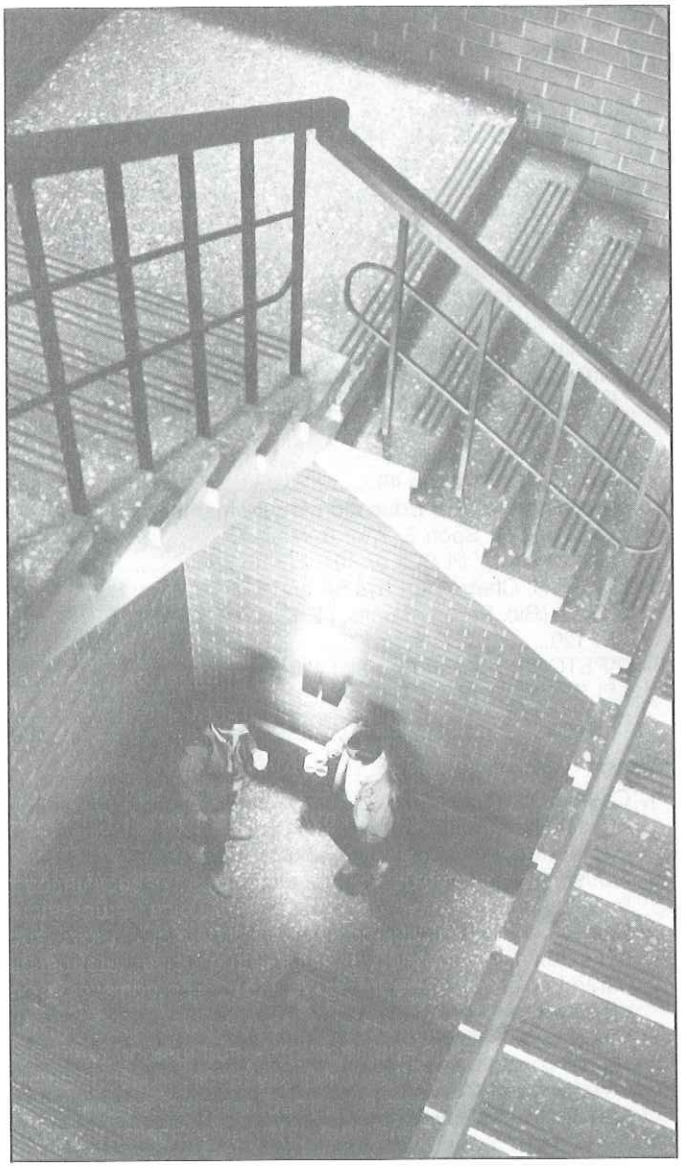
166. Energy Systems Design (3). Prerequisite: M E 156. Design and performance characteristics of conventional and alternative power generating systems; conversion of energy from primary sources; processes and machinery for extracting, upgrading and synthesizing fuels; utilization and storage. Group design project required.

180. Senior Project (2). Prerequisite: senior standing in mechanical engineering, approved subject, I E 182W. Study of a problem under supervision of a faculty member; final typewritten report required. (Individual project except by special permission)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

191T. Topics in Mechanical Engineering (1–3; max total 6). Prerequisite: permission of instructor. Investigation of selected mechanical engineering subjects not in current courses.

193. Mechanical Engineering Cooperative Internship (2–4). Prerequisite: permission of adviser. Engineering practice in an industrial or government installation. Each cooperative internship period usually spans a summer–fall or spring–summer interval. This course cannot be used to meet graduation requirements. *CR/NC* grading only.



Industrial Engineering Program

Industrial engineering deals with the design, improvement, and installation of integrated systems of people, materials, equipment, and energy. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems.

The industrial engineering faculty are committed to providing all students the advanced technology background necessary for success and growth in their selected professions. A program of study is offered to all students through a carefully designed curriculum which includes engineering analyses for the design of man-machine systems, optimization of industrial systems, and the scientific management of engineering activities. Specialized training is available in the use of modern engineering tools and techniques such as computer assisted design (CAD), computer assisted manufacturing (CAM), and ergonomic (human factors) engineering.

Bachelor of Science Degree Requirements
Industrial Engineering Major

	Units
1. Major requirements	71
I E 75, 85, 90, 110, 111, 113, 114, 115, 127, 130, 160, 162, 180	(31)
C E 20, 121	(6)
ECE 70, 90, 90L, 121 (or 128)	(9)
M E 26, 31, 112, 116, 118, 136	(16)
Approved Electives	(9)
Select at least one course from each of the following groups:	
Group A (Engineering Science): I E 112, 118, 120	
Group B (Design): I E 145, 148, 155; M E 162	
Group C (Administrative Science): Mgt 104, 106; Psych 176	
2. Additional requirements	
Math 76, 77, 81; Econ 40	15
3. Remaining General Education requirements	49
CORE: Engl 1; Spch 3, 7, or 8; Math 75; Hist 11 or 12; Pl Si 2 or 101; I E 182W	(19)
BREADTH: Chem 1A; Phys 5A and 5B; Div. 2 (Bio. Proc.), 3 units; I E 125; Phil 10, 120; Pl Si 120	(30)
CAPSTONE: Satisfied by Phil 120 and Pl Si 120 in BREADTH	(–)
Total	135

Notes:

1. Courses in mathematics, the physical sciences or engineering taken *CR/NC* are not counted toward fulfillment of degree requirements in Industrial Engineering.
2. Industrial engineering majors might consider a math or business minor.
3. Since the industrial engineering major curriculum is very demanding, many students, especially those not fully prepared in mathematics, chemistry and/or physics, take 4½ or more years to graduate rather than the traditional 4 years. Students not fully prepared in mathematics and/or chemistry should consider taking Math 71 and 72 in lieu of Math 75, and Chem 3A and 4 in lieu of Chem 1A. If needed, students also may go to the Developmental Learning Resource Center in the Keats Building and request free tutorial assistance.

Recommended Program

FIRST SEMESTER		Units
I E 75	Intro. to Industrial Engr.	1
ECE 70	FORTRAN 77 Programming	2
Chem 1A	General Chem. and Qual. Analysis	5
Hist 11/12	American History	3
Math 75	Mathematical Analysis I	4
		15

SECOND SEMESTER		
M E 26	Engineering Graphics	3
Engl 1	Composition	3
Math 76	Mathematical Analysis II	4
Phys 5A	Principles of Physics I	5
Biological Processes [1]		3
		18

THIRD SEMESTER		
C E 20	Engineering Mechanics: Statics	3
M E 31	Engineering Materials	3
Econ 40	Principles of Economics	3
Math 77	Mathematical Analysis III	4
Phys 5B	Principles of Physics II	5
		18

FOURTH SEMESTER		
I E 85	Computer Methods in Engineering	3
I E 90	Manufacturing Processes	3
Math 81	Applied Analysis	4
Pl Sci 2	American Govt and Institutions	3
Speech 3, 7, or 8		3
		16

FIFTH SEMESTER		
I E 110	Stat Analysis in Engineering	3
I E 111	Work Measurement	3
I E 160	Engineering Economy	2
I E 182W	Engineering Writing	3
M E 112	Engineering Mechanics: Dynamics	3
M E 116	Fluid Mechanics	3
		17

SIXTH SEMESTER		
I E 113	Operations Analysis	3
I E 115	Qual. Contr. and Reliability Engr	3
I E 125	Human Factors in Engr and Design	3
I E 127	Human Factors Engr Design Lab	1
ECE 90, L	Principles of Electrical Circuits	4
M E 118	Fluid Mechanics Lab	1
M E 136	Thermodynamics	3
		18

SEVENTH SEMESTER		
I E 114	Facilities Engineering	3
I E 130	Production and Inventory Control	3
I E 162	Engr Economy Design Lab	1
ECE 121	Electromech Sys and Energy Conv [2]	3
Phil 10	Self, Religion, and Society	3
Approved Electives [3]		3
		16

EIGHTH SEMESTER		
I E 180	Senior Project [4]	2
CE 121	Mechanics of Materials	3
Phil 120	Cont. Conflicts of Morals	3
Pl Si 120	International Politics	3
Approved Electives [3]		6
		17

[1] Any three unit course from Division 2.
[2] *Or* ECE 128.
[3] Approved Electives: Select at least one course from each of the three groups.
[4] With approval by the student's academic adviser and the department chair, any Group B elective may be substituted for I E 180, Senior Project.

COURSES

Industrial Engineering (I E)

10. Engineering Skills (2). Provides engineering students with experience in solving problems and presenting solutions in a logical manner, introduces students to subject areas common to most engineering disciplines and develops basic skills for solving problems through an engineering approach. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

75. Introduction to Industrial Engineering (1). An overview of the field of Industrial Engineering. Brief discussion of plant layout, work measurement, engineering economy, quality control, production control, human factors, and operations research. A brief survey of the current status of Industrial Engineering. (Field trips required)

85. Computer Methods in Engineering (3). Prerequisite: Math 81 (or concurrently). Application of existing microcomputer software and the development of new programs to solve problems frequently encountered in engineering practice. (2 lecture, 3 lab hours)

90. Manufacturing Processes (3). Prerequisite: M E 26, 31. Processing techniques, including casting, welding, forming, and machining; capabilities and limitations of these techniques. (2 lecture, 3 lab hours; field trips required) (Former M E 11)

110. Statistical Analysis in Engineering (3). Prerequisite: Math 76. Fundamentals of probability and statistics. Applications of statistical methods to engineering problems.

111. Work Measurement (3). Prerequisite: I E 110 (or concurrently). General approach to the design process; application of design process to problem solving. Methods evaluation techniques; motion and time study, work sampling, and simulation. (2 lecture, 3 lab hours; field trips required)

112. Statistical Design of Experiments (3). Prerequisite: I E 85, 110. Analysis of variance; regression and correlation; analysis of covariance; randomized blocks and Latin squares; design of experiments; response surface analysis and determination of optimum conditions.

113. Operations Analysis (3). Prerequisite: I E 85, 110, Math 81. Application of quantitative and numerical techniques for analysis of complex operational problems.

114. Facilities Engineering (3). Value analysis, materials handling, packaging, layout of facilities, safety, location of facilities.

115. Quality Control and Reliability Engineering (3). Prerequisite: I E 110. Fundamentals of statistical quality control and reliability engineering. Sampling plans. Control charts. Reliability techniques. (2 lecture, 3 lab hours)

118. Principles of Safety Engineering (3). Prerequisite: junior standing. Principles of Safety Engineering with emphasis directed to industrial situations. Selected topics include: materials handling, machine guarding, lighting, noise, ventilation, personal protective equipment, instrumentation, plant inspection, accident investigation.

120. Systems Safety Engineering (3). Prerequisite: I E 110. Principles of system safety engineering. Selected topics include: human factors engineering, key system interfaces, logic trees, fault and risk tree analyses, hazard identification and analysis, safety review system trees, statistical analysis, product safety.

125. Human Factors in Engineering and Design (3). Fundamental issues in human performance, perceptual-motor processes, information processing. Anthropometry, workplace design and layout, arrangement of system components. Controls and displays. Work physiology. Industrial biomechanics, hand tool design. Environmental physiology, effects of noise, vibration, heat and illumination on human performance. General Education BREADTH, Division 4.

127. Human Factors Engineering Design Laboratory (1). Prerequisite: I E 182W, I E 125 (or concurrently). Expands principles developed in the introductory human factors course for use in engineering design. (3 lab hours)

130. Production and Inventory Control (3). Prerequisite: I E 85, 110. Fundamental concepts of production and inventory planning, analysis and control; inventory and production costs; analysis of variations in demands, availability of supplies and optimum production schedules; use of computer simulation techniques; case studies.

145. Design of Automated Systems (3). Prerequisite: senior standing. Production operations and automation strategies, automated flow lines, flow line balancing, numerical control; fundamentals of CAD/CAM; group technology; economics of automatic process control and robotics applications. Integration of engineering experience to solve open-ended design problems. (2 lecture, 3 lab hours; field trips required)

148. Simulation of Industrial Systems (3). Prerequisite: I E 110. Application of discrete-event simulation techniques for the solution of complex industrial problems; use of various computer simulation languages; review of Monte Carlo processes and digital simulation of continuous processes.

155. Design and Applications of Robotic Systems (3). Prerequisite: I E 85, 90, senior standing. Introduction to the use of robotics for industrial automation. Components and operation of robot systems; programming of robots; robot implementation and industrial applications of robots. (2 lecture, 3 lab hours) (Former I E 191T section)

160. Engineering Economy (2). Prerequisite: upper-division standing in engineering. Importance of economic analyses of problems in engineering and in management decision making; interest, depreciation, income tax, classification of costs, break-even and minimum cost points, economic comparisons of alternatives, economy of replacement.

161. Legal Aspects of Engineering (2). Prerequisite: senior standing in engineering. Development of law, canons of ethics, torts, principles of contracts, contracting procedure and specifications, property, negotiable instruments, sales, agency and patents; preparation of reports.

162. Engineering Economy Design Laboratory (1). Prerequisite: I E 182W, I E 160 (or concurrently). The role of engineering economy in the evaluation and selection of engineering design alternatives is explored in a case study format. Optimization of engineering design and computerized sensitivity analyses are emphasized.

180. Senior Project (2). Prerequisite: senior standing in industrial engineering, approved subject, I E 182W. Study of a problem under supervision of a faculty member; final typewritten report required. (Individual project except by special permission.)

182W. Engineering Writing (3). Prerequisite: Engl 1; junior standing. The use of critical thinking in the engineering problem-solving process and documentation of the process through letters, reports and engineering specifications. Meets the upper-division writing skills requirement for graduation.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

191T. Topics in Industrial Engineering (1–3; max total 6). Prerequisite: permission of instructor. Investigation of selected industrial engineering subjects not in current courses.

193. Industrial Engineering Cooperative Internship (2–4). Prerequisite: permission of adviser. Engineering practice in an industrial or government installation. Each cooperative internship period usually spans a summer–fall or spring–summer interval. This course cannot be used to meet graduation requirements. *CR/NC* grading only.

English

School of Arts and Humanities
Department of English
Francis A. Hart, Chair
Peters Business Building
(209) 278-2553

B.A. in English
Minor in English
M.A. in English
Options:
- **Literature**
- **Creative Writing**
- **Composition**

Credential Program



English is a general major or minor designed to give proficiency in skills that traditionally have been among the most highly prized by society: an ability to read with comprehension and critical judgment; to communicate accurately and clearly both orally and in writing; to grasp difficult ideas and think logically; to do research and organize materials; to make ethical and moral judgments from a historical and humanistic framework; and to appreciate literature and the arts.

The core of the English major consists of four basic kinds of courses in the upper division: literary history courses, literary genre courses, literary seminars, and writing courses. The masterpiece courses apply to the minor and meet General Education BREADTH, Division 4 requirements. The department also offers courses in folklore and folksong, methods of research, film, and women's studies.

The Single Subject Waiver Program for teaching credential candidates contains a number of specific prerequisites and special required courses, some of which are outside the Department of English. For specific program requirements, consult each semester with the credential coordinator.

Faculty and Facilities

The English department consists of 35 full-time faculty whose teaching fields cover every area of literary studies and the humanities, including film and folklore. Most of the faculty have published books, textbooks, and articles in their disciplines, five have received outstanding teaching awards at the university, and one has received an outstanding teaching award for the entire CSU system. In addition, the faculty includes a number of lecturers, part-time instructors and teaching assistants, and the department operates an English writing lab staffed by tutors trained to work with students on an individual basis.

Career Opportunities

English has a broad application to a variety of vocations: teaching, law, journalism, editing and publishing, business management, data processing, public office, professional careers in writing, and many others. English majors and minors are being looked upon today with special favor by employers in professional and industrial fields because of their skills in writing and thinking, their ability to communicate clearly to others, and their general knowledge of people and experiences gained from the study of literature.

The English department maintains an Internship Program whereby our majors and minors, while working toward a degree, are placed in vocational positions requiring English skills. Job opportunities through this program have included positions with such organizations as the American Cancer Society and Older Americans Organization, businesses such as computer software firms and publishers of national trade newsletters, and such various employers as local congressmen, assemblymen, charitable organizations, and arts centers.

Faculty

Francis A. Hart, *Chair*

Linnea M. Aycock-Alexander
Craig A. Bernthal
Robert S. Billings
Gene Bluestein
Cheng Lok Chua
William H. Cowling
Jacqueline Doyle
Peter P. Everwine
Lillian Faderman
James E. Frey
Susan Goodman
Corrinne Hales
John R. Hales
Charles G. Hanzlicek
Christi Henson
Ruth Y. Jenkins
J. Lyn Johnson
Philip Levine
Barry L. Logan
John J. McDermott
H. Ray McKnight
Robert M. O'Neil
Martin T. Paul
Jean E. Pickering
Stanley H. Poss
Joachim S. Ries
Judith A. Rosenthal
Reuben M. Sanchez Jr.
Joseph Satin
Andrew M. Simmons
Michael G. Tate
Clare-Marie Wall
Steve Yarbrough
Eugene E. Zumwalt

Graduate Adviser: Judith A. Rosenthal
Credential Coordinator: John R. Hales
Chair, Major Advising Committee: William H. Cowling

Bachelor of Arts Degree Requirements

English Major

	Units
1. Major requirements	40
a) Lower-division requirement: Engl 20	(4)
b) Upper-division requirements: Engl 189, 193T, or 194T (if no topic repeated)	(8)
c) Approved upper-division English electives (see adviser)	(28)
2. General Education requirements	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a dual major or minor	33–36*
Total	124

* This figure takes into consideration the fact that 3 units of Engl 20 may also be applied toward General Education BREADTH, Division 6.

Notes:

1. No course used to satisfy General Education CAPSTONE requirements or upper-division General Education requirements may be used to satisfy English major requirements.
2. *CR/NC* grading is not permitted in the English major with the exception of 4 units total of Engl 175T and 186.
3. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
4. Not more than 6 units by extension and correspondence courses may be applied toward the English major: correspondence courses may be applied only if they are acceptable for the major at the college where the course is offered.
5. English majors are advised to select a course in English history as one of their upper-division electives.
6. English majors considering eventual graduate degrees should consult the graduate adviser.

English Minor

Students in many vocational fields often realize that special skill in writing may be of great use in their future work — and such skill can best be obtained through an English minor. The English minor requires 20 units above English 1, at least 12 of which must be upper division, and 4 of these units must be from 189 or 193T/194T. English 160W does not apply to the English minor. Courses taken as *CR/NC* may not apply to the minor with the exception of 4 units total of 175T and 186.

	Units
English 189, 193T, or 194T	4
Other upper-division English	8
Other English courses (not including English 1)	8
	20

Credential Program

Single Subject Waiver Program: English

(Literature/Composition option)

Prerequisites	
Engl 20 or equivalent	(4)
Engl 41, 43, 44 or equivalent	(4)
Core Courses (Choose the required number of units from each group):	31
Engl 182 (taken concurrently with T Ed 155A)	(1)
Engl 182 (taken concurrently with T Ed 155B)	(1)
Engl 189	(4)
Engl 193T or 194T	(4)
Ling 135	(3)
Ling 146	(3)
Engl 161 or 163 or 164	(4)
Engl 154 or 155	(4)
Engl 112, 113, 114, 115W, 116, 146, 147, 150, 151, 152, 153, 154, 155, 156, 167, 168T, 169T, 183T, 193T, 194T	(4)
Ling 132 or 138 or Spch 140 Drama 131	(3)
Breadth Courses (Choose the required number of units from each group):	15–17
Engl 76, 112, 113, 114, 115W, 116, 146, 147, 150, 151, 152, 153, 154, 155, 156, 161, 163, 164, 167, 168T, 169T, 183T, 193T, 194T, 250T, 261, 263, 265	(6–8)
Drama 22, 33, 34, 134A-B, 139, 185, 186; Hist 150, 151; Jour 124W; Ling 148; Phil 120; Spch 105, 108, 114, 140, 142, 162	(9)
Total	46–48

Note: 28 upper-division units in English including Engl 189 and 193T or 194T are required for the B.A.

Credential candidates should take one unit of Engl 182 concurrently with student teaching (T Ed 155B and one unit before beginning student teaching or concurrently with T Ed 155A.) T Ed 161 must be completed before beginning student teaching (T Ed 155B). It is normally offered only in the fall semester. For program planning consult the departmental coordinator for teacher education each semester.

Students fulfilling the competency requirement by taking the National Teachers Examination should obtain a description of additional requirements from the credential coordinator.

For credential programs with emphasis in speech, drama, and English as a second language, see the listings under Speech Communication, Theatre Arts, and Linguistics.

Graduate Program

The Master of Arts program in English language and literature serves several categories of students: those teaching high school and community college; those anticipating doctoral studies; those studying creative or expository writing; and those simply interested in extending and intensifying the knowledge acquired in their undergraduate studies.

Admission to the Master of Arts program in English language and literature assumes preparation equivalent to an undergraduate major in English or a related field in the liberal arts. Courses which do not count toward the English major may not be used for the M.A. degree. To reach classified standing, both English and non-English majors must achieve a GPA of 3.0 or better in their major and pass the verbal section of the GRE with a score of 500 or better. (Foreign students must also score 600 or better on the TOEFL.) In addition, all candidates must submit a writing sample to the graduate committee, whose approval is necessary for admission to the program.

Consult the graduate adviser every semester for program planning.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements, Foreign Language Requirements,* and *Criteria for Thesis and Project*)

Master of Arts Degree Requirements

Literature Option

Under the direction of a graduate adviser, each student prepares and submits a coherent program individually designed within the following framework:

Thesis Plan

	Units
English 250T or 280T	8
Other courses in English (see specific requirements)	4–8
English 299	2–6
	18
Approved electives in English or other fields	12
	30

Thesis Alternative Plan

English 250T or 280T	12
Other courses in English (see specific requirements)	6
English 298	2
	20
Approved electives in English or other fields	10
	30

Specific Requirements. The following areas must be covered by graduate or undergraduate courses (may be satisfied in undergraduate preparation): English literature (2 courses), American literature, world literature, Shakespeare, and Chaucer (1 course each).

In addition to the general Graduate Division requirements, advancement to candidacy requires a reading knowledge of one foreign language, to be demonstrated by examination; the completion of at least one graduate seminar (250T) with a grade of *B* or above; a score of 590 or better on the advanced section of the GRE; and a review by the graduate committee of the work already completed.

An interdisciplinary major may be constructed in consultation with the graduate adviser in which up to 12 units may be taken in departments other than English when such a program demonstrates a coherent program of study.

Creative Writing Option

Under the direction of a graduate adviser, each student prepares and submits a coherent program individually designed with the following framework:

	Units
English 250T or 280T	8
English 261 and/or English 263	8
English 299	2
	18
Approved electives in English or other fields	12
	30

In addition to the general Graduate Division requirements, advancement to candidacy requires a reading knowledge of one foreign language, which may be demonstrated either by passing an examination or by submitting to the creative writing staff acceptable translations of foreign poetry and/or prose, and a review by the graduate committee of the work already completed.

Composition Option

Under the direction of a graduate adviser, each student prepares and submits a coherent program individually designed within the following framework:

	Units
English 164, 166 or 265	4
English 265	8
English 250T or 280T	8
Linguistics	3–4
English 299	3
	26–27
Approved electives in English or other fields	3–4
	30

In addition to the general Graduate Division requirements, advancement to candidacy requires a reading knowledge of one foreign language, to be demonstrated by passing an examination, and a review by the graduate committee of the work already completed.

COURSES

English (Engl)

A. Fundamental Writing Skills (1–3; max total 3). All students enrolling in English A must have taken the CSU English Placement Test. Concurrent enrollment in English ARL may be required. Instruction and supervised practice in fundamental problems of writing. Intended primarily for students who need more elementary composition work before attempting English 1 or more advanced courses. Approved for *SP* grading. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

ARL. Fundamental Writing Skills Lab (1–2; max total 2). Laboratory for students who need individualized writing assignments and exercises. May be taken concurrently with English A. *CR/NC* grading only; not applicable toward baccalaureate degree requirements. (2–4 hours)

1. Composition (3–4). Prerequisite: Any one of the following test scores or successful performance in English A; CSU English Placement Test, T151 or E8 or above; SAT-Verbal, 470 or above; CSU English Equivalency Examination, satisfactory score; English Composition Examination of College Board Advanced Placement Program, 3, 4, or 5; ACT English Usage Test, 22 or above; College Board Achievement Test in English Composition with essay, 600 or above. Concurrent enrollment in Engl 1L may be required.

Theory and practice of composition for students with college-level competence in written English. Themes, chiefly expository or analytical, including one paper based on an investigation of a selected topic. General Education CORE. (CAN ENGL 2)

(See *Credit by Examination* section for information on challenge to English 1.)

1L. Writing Skills Lab (1). May be taken concurrently with Engl 1. Laboratory for students who need individualized writing assignments. *CR/NC* grading only. (2 hours)

2. Writing Workshop (1–4; max total 4). Practical assignments and individual coaching on specific writing problems. For selected students this workshop may be required to be taken concurrently with, or as prerequisite to, other courses.

20. Introduction to Literature (4). Prerequisite: Engl 1. Reading and close written analyses of short stories, novels, drama and poetry. General Education BREADTH, Division 6. (CAN ENGL 4)

21. Critical Reading and Thinking (4). Critical reading and written analyses of various kinds of writing. Practice in close analysis with attention to the adequacy and accuracy of evidence, the logical structure of argument and definition, common fallacies, persuasive and expressive language, and language as culture. General Education CORE, Critical Thinking.

30. Masterpieces (4). Prerequisite: Engl 1. Discussion and written analyses of widely influential poetic, dramatic and fictional works by British, American and world authors, with special attention to the use, adequacy and accuracy of evidence, logical structure of argument, common fallacies, and persuasive and expressive language. General Education CORE, Critical Thinking.

41. Poetry Writing (4). Prerequisite: Engl 20. Beginning workshop in the writing of poetry; appropriate reading and analyses. General Education BREADTH, Division 4.

43. Fiction Writing (4). Prerequisite: Engl 20. Beginning workshop in the writing of fiction; appropriate reading and analyses. General Education BREADTH, Division 4.

44. Prose Writing (4). Prerequisite: Engl 1. Beginning workshop in forms of non-fiction prose writing: appropriate readings and analysis. Special attention to the use, adequacy and accuracy of evidence, logical structure of argument, common fallacies, and persuasive and expressive language. General Education CORE, Critical Thinking.

50T. Studies in Literature (1–4; max total 8 if no topic repeated). (Same as W S 50T.) Prerequisite: Engl 1. Sections designated as emphasizing certain writers, types, or themes (for example, Shakespeare, The Poem, Literature of Protest, Women in Novels). Appropriate readings and analyses.

76. Programs in Film Genres (2–3; max total 3). Not open to students with credit in English 176T. Film as literary form; viewing and analyses of selected examples from comedy, musical, horror, science fiction, and other genres.

100W. Writing Skills (1). Credit obtained only by passing Upper-Division Writing Skills Examination and upon request. *CR/NC* grading only.

101. Masterpieces of World Literature (4). Discussion and written analyses of widely influential poetic, dramatic, and fictional works studied in translation. Not applicable to the English major. General Education BREADTH, Division 6.

102. Masterpieces of English Literature (4). Discussion and written analyses of widely influential poetic, dramatic, and fictional works by British authors. Not applicable to the English major. General Education BREADTH, Division 6.

103. Masterpieces of American Literature (4). Discussion and written analyses of widely influential poetic, dramatic, and fictional works by American authors. Not applicable to the English major. General Education BREADTH, Division 6.

112. World Literature: Ancient (4). Greek and Latin literature in translation. Discussion of major works of Greek and Latin literature such as Homer, Sophocles, Euripides, Aeschylus, Aristophanes, Alcaeus, Theocritus, Virgil, Ovid, Catullus, Lucretius, Juvenal. Course includes written analyses of various themes expressed in the individual work. General Education CAPSTONE Cluster, Critical Thinking.

113. World Literature: Medieval and Renaissance (4). Discussion and written analyses of authors and works (in translation). Selections may include Dante, Rabelais, Cervantes, Murasaki, Boccaccio, the Petrarchan tradition, Tu Fu, Basho, troubadour poetry, epic, romance, fabliau. No morality plays, Lope de Vega, Erasmus, Montaigne, Castiglione. General Education CAPSTONE Cluster, Critical Thinking.

114. World Literature: Modern (4). Major movements in world literature from the Renaissance to the present. Discussion and written analyses of works by such authors as Voltaire, Goethe, Dostoyevsky, Ibsen, Mann, Kafka, Dinesen, Mishima, Borges, Garcia Marquez, and Achebe. General Education CAPSTONE Cluster, Critical Thinking.

115W. Literature of the New Testament (3). (See Phil 133W.) Prerequisite: Engl 1. Meets upper-division writing skills requirement for graduation.

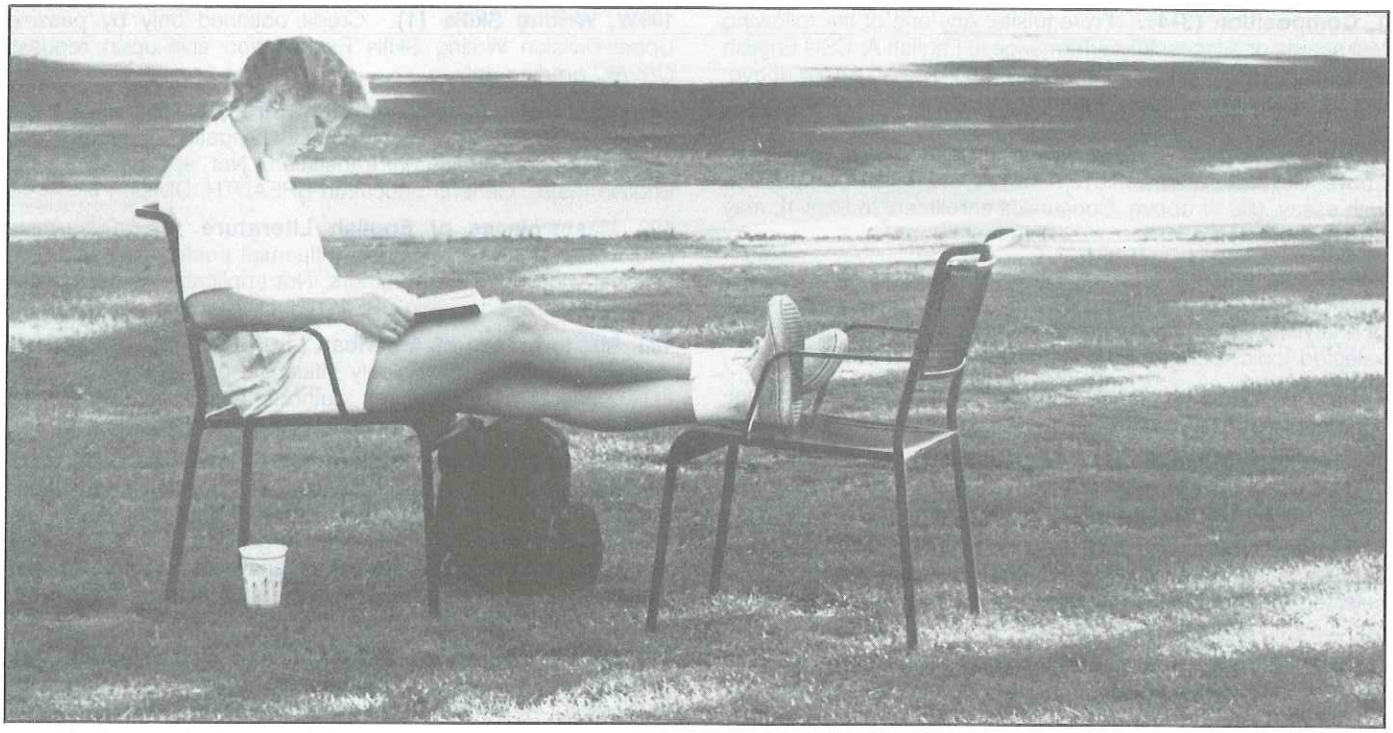
116. Literature of the Old Testament (4). (See Phil 134.) General Education CAPSTONE Cluster. (Former Engl 116W)

146. Beowulf to Malory (4). The literature of Medieval England, including the works of Malory and Chaucer; narrative poetry *(Beowulf, Piers Plowman, Sir Gawain and the Green Knight)*; drama; and lyric poetry. Discussion, lectures and written analyses (papers, tests).

147. Renaissance (4). Discussion and written analyses of works by selected playwrights (Webster, Dekker, Jonson) and poets (Spenser, Donne, Herbert, Marvell, Milton) from the 16th and 17th centuries. General Education CAPSTONE Cluster, Critical Thinking.

150. The Age of Wit (4). Discussion and written analyses of British literature from 1660 to 1800. Major writers and topics include Dryden, Swift, Pope, Johnson, Restoration comedy, and the rise of the novel. The literature will be read in the context of political and intellectual history and the arts.

151. 19th Century Romantics (4). A study of the Romantic movement in England during the early decades of the 19th century. Authors to be read include Blake, Wordsworth, Coleridge, Byron, Shelley and Keats. Written analyses on selected topics will be required.



152. Dickens to Hardy (4). Discussion and written analyses of 19th century English literature including poetry (Tennyson to Hopkins), the novel (Dickens to Hardy), the essay (Carlyle to Pater). Possible topics: Utilitarianism, Evangelicalism, Darwinism, the Pre-Raphaelites, the Decadents, the New Woman.

153. American Literature to Whitman (4). Discussion and close written analyses of major works and their backgrounds in American literature to the Civil War. Includes Puritanism, Emerson, Thoreau, Hawthorne, Melville, Poe and Whitman.

154. American Literature 1865 to WWI (4). Discussion and written analyses of major works and their cultural backgrounds within this period of change. Topics include the rise of realism and naturalism. Writers discussed include Whitman, Twain, Howells, James, Crane, Dickinson and others.

155. 20th Century American Literature (4). Discussion and written analyses of selected poems, plays, and fiction from WWI to the present by such authors as Frost, Eliot, Anderson, Hemingway, O'Neill, Faulkner, Fitzgerald, Steinbeck, Stevens, Williams and post-WWII writers.

156. 20th Century British Literature (4). Discussion and written analyses of selected poems, plays, and fiction from 1900 to the present by such authors as Forster, Yeats, Woolf, Lawrence, Joyce, Greene, Auden, Thomas and post-WWII writers.

160W. Writing Workshop (4; max total 8). Prerequisite: Engl 1. Practical assignments in writing, directed according to each student's individual needs. May be elected as preparation for special composition requirements. Does not apply to the English major or minor. Meets the upper division writing skills requirement for graduation.

161. Advanced Writing of Poetry (4; max total 8). Prerequisite: Engl 41. Intensive workshop in the writing of poetry; appropriate readings and analyses.

163. Advanced Writing of Fiction (4; max total 8). Prerequisite: Engl 43. Intensive workshop in the writing of fiction; appropriate readings and analyses.

164. Advanced Prose Writing (4; max total 8). Prerequisite: Engl 1. Workshop in all forms of non-fiction prose writing; appropriate readings and analyses. Designed for majors in all fields who want to develop their writing.

166. Technical Writing (4; max total 8). Prerequisite: Engl 1. Workshop in writing of specialized information. Designed for students interested in career-related writing skills.

167. Studies in Folklore and Folk Song (4). Discussion and written analyses of the oral and historical sources of folk tradition, including regional and ethnic styles gathered from primary and secondary materials.

168T. Women and Literature (4; 12 units max of Engl 168T plus 169T toward English major). (Same as W S 168T.) Prerequisite: Engl 20. Discussion and written analysis of literature by and about women. Special emphasis on 19th and 20th Century authors including the Brontes, George Eliot, Emily Dickinson, Edith Wharton, Virginia Woolf and contemporary writers.

169T. Forms of Literature (4; 12 units max of Engl 168T plus 169T toward English major; repeatable with different topics). Sections designated as emphasizing poetry, drama, novel, short story, perhaps limited to a specific period or subclass; for example, 18th Century English Novel, 20th Century British and American Poetry, Modern Short Stories, 20th Century Drama, Tragedy, Folklore, Mythology. Discussion and written analyses are required.

174. Popular Fiction (3). A survey of the major types of commercial fiction (detective/adventure, science fiction, horror, spy, Western, best sellers, etc.) covering the conventions and subtypes of these forms. Discussion; lectures on social background and literary technique; writing. General Education CAPSTONE Cluster.

175T. Lectures in Literature (1–4; max total 8, if no topic repeated). Lectures in a selected topic in literature or related fields by the regular faculty and/or visiting lecturers.

176T. Genre Film: Form and Function (1–4; max total 8, if no topic repeated). (Same as W S 176T.) Concurrent enrollment in English 76 not permitted. Discussion and close written analyses of selected topics, including such types as comedies, musicals, horror films, westerns, etc.

181. Research Methods (4). Prerequisite: English major. Introduction to research methods, documentation, biographical research, questions of authorship, problems of establishing accurate texts, historical bibliography, editing of texts and the academic profession of English. Research assignments, reports, written examination.

182. English Workshop (1–4; max total 8). Seminar in composition and learning. Discussion and practical exercises concerning theory, evaluation, and improvement of language learning and composition. *CR/NC* grading only.

183T. Seminar in Literature (1–4; max total 8). Prerequisite: appropriate upper-division literature course. Designed for students interested in in-depth study of a literary topic; recommended for liberal studies majors. Seminar in an aspect of literary history, type, period, movement, individual author. Reports and written analyses required.

185. English Internship Seminar (2). Prerequisite: permission of instructor. Seminar to be taken concurrently with English 186 during the first semester of enrollment in program. Group and individual analyses of writing done in internship assignments. Discussion of the rhetorical problems of writing for public agencies, magazines and journals, and private industry.

186. Internship in English (2–6; max total 6). Prerequisite: permission of instructor. No more than 2 units of 186 may apply to the English major. See also 185. Supervised work experience in public agencies and private industry to provide an opportunity to develop professional writing skills. Approved for *SP* grading. *CR/NC* grading only.

189. Shakespeare (4). (Same as Drama 194.) Reading and written analyses of the major works of Shakespeare.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

191T. Supervised Independent Reading (1–4; max total 4, if no topic repeated). Reading works from a literary period (for example, Beowulf to Marlowe, American Literature to Whitman, World Literature: Ancient and Medieval) and discussion in individual conferences.

192. Projects in English (1–4; max total 8). Not applicable to English major. Individual projects in problems related to teaching English composition and literature; for example, tutoring minority students, investigating the effectiveness of programs in English composition and literature, devising new approaches to teaching English.

193T. Seminar in Literary Studies (4; repeatable with different topics). No more than 12 units of 193T–194T may be applied to the English major. Sections designated by topic. Individual projects; reading, discussion and writing of papers on individual writers (for example, Milton, D.H. Lawrence), short periods of literary history (for example, Romantic Poets, Modern Novel), literary themes and traditions (for example, Transcendental Vein in American Literature, Arthurian Tradition) literary criticism (for example, Problems in Modern Criticism, Archetype and Myth), and other special topics. English 193T should ordinarily not be taken until 3 upper division courses in English have been completed.

194T. Seminar in Women and Literature (4; repeatable with different topics). (Same as W S 194T.) May be substituted for Engl 193T in the English major; no more than 12 units of Engl 193T–194T applicable to the major. Sections designated by topic. Individual projects; reading, discussion and writing papers on individual women writers or some aspect of women in literature; for example, Doris Lessing, Myth and Archtypes of Women. English 194T should ordinarily not be taken until 3 upper division courses in English have been completed.

GRADUATE COURSES

(See *Course Numbering System.*)

250T. Seminar in Literature (4; repeatable with different topics). Prerequisite: major or minor in English; permission of instructor. Seminar in an aspect of literary history, type, period, movement or an individual author (for example, Fiction, Seventeenth Century Lyric Poetry, The Irish, Dickens).

261. Seminar: Writing Poetry (4; max total 12). Prerequisite: permission of instructor. Advanced individual projects in the writing of poetry.

263. Seminar: Writing Fiction (4; max total 12). Prerequisite: permission of instructor. Advanced individual projects in the writing of fiction.

265. Seminar: Expository Writing (4; max total 12). Prerequisite: permission of instructor. Advanced individual projects in expository writing.

280T. Seminar in Critical Theory (4; max total 12 if no topic repeated). Prerequisite: major or minor in English; permission of instructor. Seminar in literary criticism (for example, Literary Critics).

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

291T. Supervised Independent Reading (1–4; max total 4 if no topic repeated). Reading works from a literary period (for example, More to Milton, 20th Century American Literature, World Literature, Renaissance-Modern) and discussion in individual conferences. Approved for *SP* grading.

298. Project (2). Prerequisite: See *Criteria for Thesis and Project.* Revising, amending, and editing of three original scholarly papers produced while enrolled in graduate seminars, with the goal of creating publishable journal articles. The student's committee must approve of the scope and quality of the papers. Abstract required. Approved for *SP* grading.

299. Thesis (2–6; max total 6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

300. English Colloquium (2; max total 6). Credit is not applicable to degrees or major requirements in credentials. Prerequisite: teaching experience. Problems in composition, literature or linguistics in relation to teaching.

Ethnic Studies

School of Social Sciences
Ethnic Studies Program
(African-American Studies, Native-American Studies)
Robert S. Mikell, Coordinator
McKee Fisk Building, Room 243
(209) 278-2832

Minor in Ethnic Studies
Minor in African-American Studies



The Ethnic Studies Program is an interdisciplinary curriculum that offers a broad course of study of the different ethnic groups in American society, with classes in African-American Studies and Native-American Studies. Students will find that some classes make use of various ethnic guest lecturers so that they may benefit from the multi-ethnic perspective imparted by a group of specialists. Whether for academic interest, personal knowledge or professional training, students should find courses in the Ethnic Studies Program of special cultural enlightenment.

Many Ethnic Studies classes can be applied to the social science major and to General Education requirements. Students in the helping professions such as criminology, social work, education, health sciences, nursing, recreation and communicative disorders, should find ethnic studies courses of benefit to their future careers. For those students who wish to earn a bachelor's degree in one of the Ethnic Studies areas, a "Special Major" may be declared by combining one of these areas with a traditional discipline (i.e., African-American Studies and Sociology).

The minor in Ethnic Studies or African-American Studies offers students an excellent opportunity to gain an academic background of the major minority groups in America. In the marketplace, students should find their academic credentials much more salable when one of these minors is combined with their chosen major.

African-American Studies

African-American Studies represents a relatively new field of study and research based on vigorously innovative educational processes. The courses offered are inter-disciplinary in nature and address themselves to issues that pertain to minorities in the American society. The program is structured to provide better service to the student population at CSU, Fresno. This includes the historical contributions and the sociological, psychological and economic problems that confront African-Americans in the American society.

This program establishes concepts and tools for the survival of African-American people and presents to *all* university students the understanding of the uniqueness of minority heritage, culture and lifestyles. The philosophy and academic curriculum of the African-American Studies Program were developed through a special relationship (mutual under-standing and cohesiveness) established between the communities, students and its faculty.

The African-American Studies Program includes career counseling, cluster advising, experimentation and computer technology, curriculum development, increased use of mathematics offerings and science courses, professional education orientation and extended day, evening and Saturday courses. The African-American Studies Program sponsors and supports various student organizations (i.e., Black Students' Business Association, Pan-African Student Union, etc.) and the student campus newspaper, Uhuru Na Umoja. It also works in conjunction with the CSU, Fresno Black Alumni and Friends Association to sponsor various student activities.

The African-American Research Center is an ancillary unit housed within the African-American Studies Program. The major objective of the research component is to provide a forum for a wide range of research on the African/African-American experience. In doing so, it creates an open dialogue in which academics can interact to sustain and support a creative atmosphere for scholarly inquiry.

Native-American Studies

Native-American Studies is a sub-discipline of Ethnic Studies, focusing on the indigenous cultures of ancient, historical and contemporary America. Native-American cultures include American Indians and Arctic-Native people, as well as Native people of Northern Mexico. This program recognizes the artificiality of both the Canadian and the Mexican border, but is primarily concerned with people of the United States.

The courses offer a distinctively American perspective that is crucial to an understanding of the historical and social processes that have led to the development of contemporary American society. Issues of colonization, Native rights, sovereignty, cultural integrity, civil rights, and current struggles are discussed within an interdisciplinary framework.

This program is intended to strengthen the position of Native-American individuals and communities in this region, as well as provide help to Native-American students and scholars. A second focus introduces native cultures and issues to all students. Courses include both the social sciences and the humanities, as well as specialized offerings in such fields as law and education.

Faculty

Robert S. Mikell, *Coordinator, Ethnic Studies Program*

Delores J. Huff
James H. Rogers
Malik Simba
Lily B. Small

Ethnic Studies Minor

The minor in Ethnic Studies consists of 21 units, of which 9 must be upper division.

	Units
Eth S 1, 2, or 4	6
Approved electives in one of the areas listed below (Asian-American Studies, African-American Studies, Chicano and Latin American Studies, and Native-American Studies)	9
Approved Asian-American Studies, African-American Studies, Chicano and Latin American Studies, and Native-American Studies electives from one of the areas not used above	6
	21

A student intending to pursue a minor in Ethnic Studies should see the coordinator for assignment to a faculty adviser who assists the student in planning his or her program.

African-American Studies Minor

	Units
Eth S 1 or 2	3–6
Approved African-American Studies career-oriented courses (upper division)	9
Approved African-American Studies electives	6–9
	21

Note: For students interested in the general dimensions of the African-American experience, the following courses are recommended:

Af Am 27, 36, 38, 130T, 135, 137, 140.

For students interested in the following careers, the following courses are recommended:

Education	Af Am 38, 42, 110, 124, 130T, 135
Performing Arts	Af Am 21, 24, 27, 35, 121, 130T, 144, 189
Business	Af Am 38, 130T, 135, 136, 189, 190
Preprofessional (Nursing, Criminology, prelaw, etc.)	Af Am 56, 130T, 135, 142, 144, 146, 189, 190
Writing	Af Am 15, 25, 127, 190
Social Sciences	Af Am 27, 38, 135, 140, 178, 189

Asian-American Studies Minor

(See *Asian-American Studies* in *Courses and Programs* section.)

COURSES

Ethnic Studies (Eth S)

1. Ethnic Experience (3). Comparative study of ethnic minorities in the United States, combining the perspectives of history, sociology, and psychology. General Education BREADTH, Division 9.

2. Ethnic Expression (3). Comparative study of the characteristic ways in which ethnic minorities in the United States think and feel about themselves and the world, as reflected in literature, art, and music.

4. American Poverty (3). Multi-ethnic and interdisciplinary perspective on poverty as a worldwide phenomenon, with emphasis on America; geographic analysis of migration to poverty areas such as urban ghettos and other minority areas; policy alternatives for dealing with poverty.

130T. Topics in Ethnic Studies (1–3; max total 6). In-depth research and writing on the past and contemporary situation of America's major ethnic minorities.

African-American (Af Am)

15. Basic Composition and Communication (3). Designed to help students express themselves concisely and clearly both in speech and writing; assist students to overcome difficulties in spelling, grammar, punctuation, sentence construction; investigate techniques and methods to develop term papers. (Former Bl S 15)

21. and 121. Black Gospel Choir (1; max total 8). Performance of a variety of inspirational songs reflecting the African-American cultural experience. Participation through rehearsals, activities, programs, and field trips. (Former Bl S 21 and 121)

24. African-American Music (3). The origin and evolution of African-American music from the perspective of social and cultural history. Emphasis on slave songs, gospel, jazz, rhythm and blues, and soul music. (Former Bl S 24)

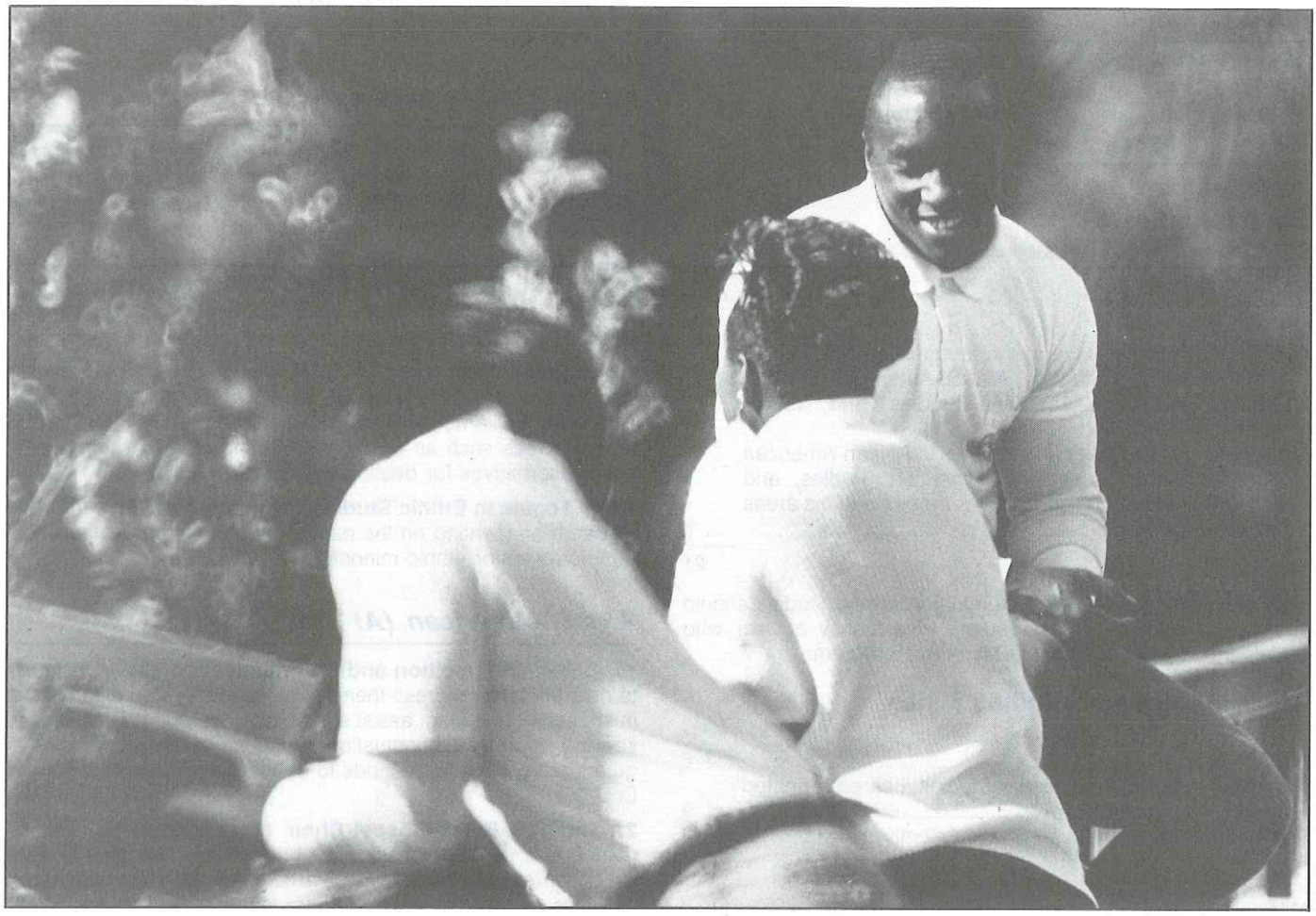
25. African-American Literature (3). Major authors, their works, themes and movements in African-American literature in America from colonial times to the present. General Education BREADTH, Division 9. (Former Bl S 25)

27. Introduction to African-American Culture and Image (3). Introduction to the social experience of African-Americans in American life and to various images of that experience which have developed historically. General Education BREADTH, Division 9. (Former Bl S 27)

35. Art and Music of Africa (3). Comprehensive study of African artistry and music. (Former Bl S 35)

36. Contemporary African Societies (3). Analysis of the cultural and political structure of some Black African nations; understanding the impact of colonialism in Africa; realizing the relationship of African-Americans to Africa. (Former Bl S 36)

38. African-American Sociology (3). Basic principles of sociology from the perspective of the African-American experience. General Education BREADTH, Division 9. (Former Bl S 38)



42. Ethnic Psychology (3). Introduction to psychology as an empirical science; biological and social basis of behavior; evaluation of concepts or general psychology and personality theories; emphasis on perception, learning, motivation and intelligence; applicability to behavioral patterns of African-Americans. (Former BI S 42)

50T. Topics in African-American Studies (1–3; max total 9). Selected topics at the introductory level in African-American Studies.

56. The African-American Family (3). This course deals with the origin, development and adaptations the African-American family has created to sustain itself as a viable institution. Emphasis is on problems encountered and created by the American society and how the African-American family handles these adversities. (Former BI S 56)

60. Introduction to African-American Theatre (3). Study and practice in performance of African-American drama and oral interpretation projects. Class will include poetry reading; dance performances; dramatic interpretations; comedic sketches. Previous experience not required. (Former BI S 60)

110. The Educational System and the African-American Community (3). The effects of the educational system on African-Americans. Analysis of the economical, sociological, and political foundations of education as they are related to African-Americans. (Former BI S 110)

124. The African-American Experience in Children's Literature (3). A survey of selected material: Children's books, tapes, cassettes; dealing with the African-American experience in children's literature. (Former BI S 124)

127. African-American Creative Writers Workshop (3). An intensive, reading and writing workshop in the African-American experience. Selections and discussions from major literary artists, including: Hughes, Baldwin, Giovanni, Brooks, Ellison, Angelou, Gaines, and others. Students are required to write expository essays analyzing literature, poems, and short stories. (Former BI S 127)

129. African-American Literary Classics (3). An intensive analysis of selected classical narratives in African-American literature and culture. (Former BI S 129)

130T. Topics in African-American Studies (1–3; max total 9). Major social problems confronting African-Americans in America today; emphasis on welfare, education, legal systems, religious institutions, and economic institutions; effect on the African-American segment of the population. (Former BI S 130T)

135. The African-American Community (3). Analysis of the various lifestyles and cultural patterns of the African-American community and spatial ghetto areas. Emphasis on unique cultural features of the family, religion, foods, music, art and folkways. General Education CAPSTONE Cluster. (Former BI S 135)

136. African-American Business Economic Development in the United States (3). Introduction to African-American business enterprises with special emphasis on the analysis and developments of African-American business from early slave trade to present day. Relationship of economic forces to historical, political, and social change pertaining to African-Americans. (Former Bl S 136)

137. African-American Women (3). (Same as W S 137.) An overview of the accomplishments of African-American women in the United States; their contributions to American culture; African influence; African-American women as defined by a dominant society vs. legitimate definition designed to encourage a positive self-concept. General Education CAPSTONE Cluster. (Former Bl S 137)

140. The African-American Church (3). History of the formation and development of African-American religious institutions (Christianity, Islam, Judaism) in the African-American community; their effect on the African-American personality. (Former Bl S 140)

141. African-American Health Care (3). Investigation and analysis of major health problems and delivery services in the African-American Community. (Former Bl S 141)

142. African-American Child Rearing (3). Specific and unique issues facing African-American parents as their children journey through the development process. (Former Bl S 142)

144. Race Relations (3). An examination of race in American society as it affects major social issues such as stratification, income distribution, and political power, with concern for theoretical orientations toward the study of African-American/white race relations. General Education BREADTH, Division 9. (Former Bl S 144)

145. Life and Times of Martin Luther King Jr. (3). This course explores Dr. King's leadership in the non-violent movement for racial equality and human dignity, from Montgomery Bus Boycott to King's assassination (1955-68). Emphasis on philosophy, ideology. Format: lectures, films, slides, recorded speeches and discussion. (Former Bl S 145)

146. Law and the Minority Community (3). Critical analysis of the foundation and changing structure of law and legal institutions as perceived by minority communities, with emphasis on consumer protection, equal employment and education, criminal justice and political power. (Former Bl S 146)

150. South Africa (3). An introductory analysis of the social, racial, political and economic problems of people of South Africa, both past and present. (Former Bl S 130T)

165. Advanced African-American Theatre (3). For students previously enrolled in Af Am 60. Advanced production and performance in the African-American Theatre. (Former Bl S 165)

178. History of African-Americans (3). (Same as Hist 178.) Evolution of African-American society from 1619 to the present; emphasis on the social, political and economic aspects as they relate to cultural values, theories in the development and environment that contribute to the African-American way of life. (Former Bl S 178)

189. Field Work in Community Relations (3; max total 6). Supervised field observation, participation and documentation in the operation of minority communities. (Former Bl S 189)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading. (Former Bl S 190)

I have a new perspective of my life, the United States and the world.

Karen Wrigley
Senior, Business,
after participating in the university's China Semester

Native-American Studies (N A S)

5. Native American History (3). An interpretive survey of Native American history from the native point of view including accounts of Native American origin and the arrival of immigrants from Asia, Africa and Europe.

9T. Topics in Native-American Studies (1–3; max total 9 if no area repeated). Selected topics at an introductory level in Native-American Studies.

50. Contemporary Life of the Native American (3). Current problems of American Indians and Arctic Natives resulting from culture conflict, acculturation, minority status, and governmental policy. General Education BREADTH, Division 9.

60T. Topics in Indian Education (3; max total 9). Foundations and history of Indian education, methods of teaching Indian children, curriculum and practices for Indian education, guidance for the Indian student, problems of teachers of Indian children, education of Indian adults.

100. American Indian Religion (3). Native American religious systems, including basic concepts of religion and the sacred, ceremonial life, medicine, functions of religious institutions and practices, and contrast/conflict with non-Native religious systems. General Education CAPSTONE Cluster.

101. American Indian Law (3). Concepts of laws on Indian reservations, termination, litigation and complaints, strengthening tribal governments. Law related to Indian land and resources.

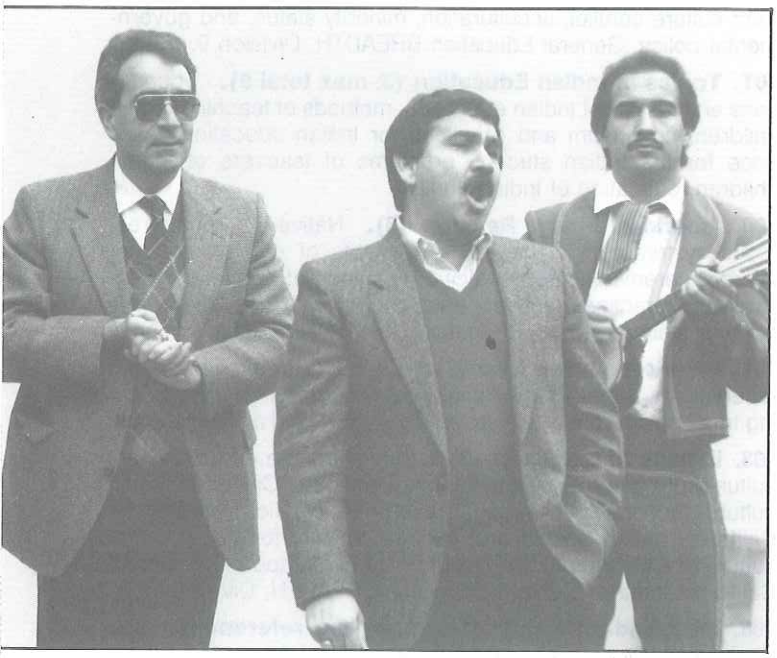
103. Indians of California (3). Survey course on the ancient cultures of California, historical development of California Indian cultures according to regional resources, conflict between the California Indian people and various colonial forces, arts and culture of California Indian people, and contemporary issues of California Indians. General Education BREADTH, Division 9.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

Foreign Languages

School of Arts and Humanities
Department of Foreign Languages
Maurice Gendron, Chair
San Ramon 4, Room 131
(209) 278-2386

M.A. in Spanish
B.A. in French
B.A. in German
B.A. in Russian
B.A. in Spanish
Minor in Armenian Studies
Minor in French
Minor in German
Minor in Latin
Minor in Russian
Minor in Spanish
Single Subject Teaching Credential in: French, German and Spanish



Because of increasing mobility in our modern world, it takes no time at all to travel to places where people speak a language other than English. Even in California scarcely a day goes by that you do not hear people conversing in a foreign language. If you visit or go to work in another country you will quickly learn the fallacy of the phrase, "Everyone speaks English there; don't worry!" You can never fully appreciate the differences between your own way of life and the life of others unless you get out and communicate with them in their own language. When you know a foreign language you can learn even more about other cultures by reading newspapers, magazines, and books.

The goal of the Department of Foreign Languages is to prepare you for communication with other peoples, so that you may move about with greater ease in an everchanging world. We offer the study of the humanities through foreign languages. We provide training for teaching in secondary schools and junior colleges. We offer courses specifically to prepare individuals for bilingual/cross-cultural teaching in public schools. We provide basic foreign language training for professions such as health and agriculture. We offer courses to train translators. We prepare students who wish to pursue graduate studies.

The department offers a major and a minor in the following modern foreign languages: French, German, Russian and Spanish. Secondary Teaching Credentials are available in French, German and Spanish. The Master of Arts degree may be earned in Spanish. We also offer basic courses in Italian and Portuguese.

For those interested in the study of the Classics, we have a minor in Latin, which may be complemented by courses in Classical Greek.

The Department of Foreign Languages has a foreign language laboratory to provide students with additional listening and oral practice.

International Programs

Juniors and seniors have the opportunity for the invaluable experience of studying in a foreign country through the California State University International Programs. This one-year program is especially recommended for foreign language majors and minors. See *International Programs (Overseas)* for more information.

Career Opportunities

Since a foreign language degree increases your ability to communicate with people, it provides a wide variety of career opportunities. In today's world of international markets and international professional exchange, the knowledge of another language and culture can be a great asset for success in any field. Many possibilities exist for employment with the U.S. Government and with international organizations, airlines, shipping companies, agricultural enterprises, and multinational corporations, even though there may be strong competition for some types of positions both at home and abroad.

In California, fluency in Spanish can be a very useful adjunct to your education in the fields of social work, health, elementary or secondary school teaching, teaching English as a second language, or other public service work where ethnic understanding is important.

When your primary major is in another career area, a second major or a minor in a foreign language is a very good way to acquire and document language skills important for a job or profession.

A great number of foreign language majors aim for a teaching career. Teaching at the college level requires at least a master's degree, while teaching in the public schools requires a teaching credential. There is currently a strong demand for high school language teachers due to the establishment of a foreign language admissions requirement in the University of California and California State University systems. There are many opportunities for teaching in elementary schools having bilingual/cross-cultural programs in Spanish.

Do not hesitate to visit the department office to seek advice that can help you plan the course of study that will best meet your career goals. Faculty advisers can provide you with up-to-date information on career perspectives in foreign languages.

Faculty

Maurice C. Gendron, *Chair*

Jacinta R. Amaral (Spanish)
John M. Barta (Portuguese, Spanish)
Wayne S. Bowen (Spanish)
Helen L. Dmitriew (Russian)
Jose A. Elgorriaga (Spanish)
David G. Engle (German)
G. Ronald Freeman (Spanish)
Maurice C. Gendron (French, Italian)
June M. Gill (French)
Victor D. Hanson (Greek, Humanities)
Cordelia Jasutis (French)
Paul F. Kinzel (French)
Dickran Kouymjian (Armenian)
Rose Marie Kuhn (French)
Margarita Lopez-Urrutia (Italian, Spanish)
Alexander Pronin (Russian)
Matthias Rosenthal (German)
David A. Ross (French)
Ignacio B. Santesteban (Spanish)
Keith E. Sauer (Spanish)
Adriana N. Slaniceanu (Italian, Spanish)
Pamela L. Vaughn (Latin, Humanities)
Cosme M. Zaragoza (Spanish)

G. Ronald Freeman, Graduate Adviser

Credit Allowance in Foreign Language

Students who have taken one year of a foreign language in high school may not receive credit for a 1A course in that language. Students who have had two years of a foreign language in high school may not receive credit for a 1B course in that language (Classical Greek and Latin excluded).

Credit by Examination. Students who have taken one or more years of a language in high school may not challenge a 1A course in that language. Students who have taken two or more years of a language in high school may not challenge a 1B course in that language. Students who have taken three years of a language in high school may not challenge 2A in that language.

Students from non-English speaking countries who have received their education in the language of that country may not enroll in or receive Credit by Examination for lower-division courses in that language. Such students are not exempted from meeting the General Education requirements of Divisions 4 through 7.

Credit may not be awarded for a lower-division foreign language course if the student has received credit for an upper-division course in that language.

General Education Foreign Language Credit

The following courses in Divisions 6 and 7 are applicable to the General Education Requirement: Division 6, Armenian 148; French 109, 148; Greek 148; German 148; Latin 148; Russian 148; Spanish 140, 142, 146. Division 7: Armenian 1A, 1B, 2A, 2B; Chinese 1A, 1B, 2A, 2B; French 1A, 1B, 2A, 2B; German 1A, 1B, 2A, 2B; Greek 1A, 1B; Italian 1A, 1B; Latin 1A, 1B; Portuguese 1A, 1B; Russian 1A, 1B, 2A, 2B; Spanish 1A, 1B, 2A, 2B, 4A, 4B.

Bachelor of Arts Degree Requirements

French Major

Units

1. Major requirements (see Notes 1, 2 and 3 below) 30–44
   a) Lower division: Fren 1A, 1B; select two: Fren 2A, 2B, 4, 5 (see Notes 3 and 4) ..... (14)
   b) Upper division:
      1. Fren 101, 102, 109 ..... (9)
      2. Select three: Fren 110, 111, 112, 113 ..... (9)
      3. Select four: Fren 120T, 132, 148, 149, 150, 160T (see Notes 4 and 5) ..... (12)
2. General Education requirements (see Notes 2 and 5) 51
3. Electives, including other lower- and upper-division French courses, and remaining degree requirements (see *Degree Requirements*) may be used toward a dual major or a minor 29–49*

Total 124

* This figure takes into consideration the fact that a maximum of two General Education BREADTH courses (6 units) from one department may be applied to satisfy French major requirements (see *General Education*). These courses may be selected from French 1A, 1B, 2A, 2B and 109 in General Education BREADTH Division 6 and 7. Consult a French major faculty adviser for details.

Notes:

1. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy French major requirements.
2. *CR/NC* grading is not permitted for courses in the French major.
3. A maximum of two courses from one department may be used simultaneously to satisfy both the General Education BREADTH requirement and the major requirements. If the French major is the secondary major in a dual major (see *Dual Major*), this limitation does not apply. Consult a faculty adviser for additional details.
4. French majors who have studied French in high school or who by culture or experience can speak French at a certain level of proficiency must consult with a French adviser to determine which required lower-division courses, if any, may be waived. (Also see *Credit Allowance in Foreign Language*.) French majors who are able to enroll immediately in Fren 1B, 2A, 2B, 4, 5 or in an upper-division French course are not required to make up the lower-division units waived.
5. Only 3 units of courses taught in English may be applied to the French major.

German Major

Units

1. Major requirements (see Notes 1, 2 and 3) 27–41
   a) Lower division: Germ 1A, 1B, 2A–B (see Note 2) ..... (14)
   b) Upper division:
      1. Germ 101 ..... (6)
      2. Germ electives (see Note 3) ..... (21)
2. General Education requirements 51
3. Electives, including other lower- and upper-division German courses, and remaining degree requirements (see *Degree Requirements*) may be used toward a dual major or a minor 32–49*

Total 124

* This figure takes into consideration the fact that 3 units of German 1A, 1B, or 2A–B may also be applied to General Education BREADTH Division 7 (see *General Education*). Consult a German major faculty adviser for details.

Notes:

1. *CR/NC* grading is not permitted for courses in the German major.
2. German majors who have studied German in high school or who by culture or experience can speak German at a certain

level of proficiency must consult with a German adviser to determine which required lower-division courses, if any, may be waived. (Also see *Credit Allowance in Foreign Language.*)
German majors who are able to enroll immediately in German 1B, 2A–B, or in an upper-division German course are not required to make up the lower-division units waived.
3. Only 3 units of literature courses in English translation may be applied to the German major.

Russian Major

	Units
1. Major requirements (see Notes 1 and 2)	24–37
a) Lower division: Russ 1A, 1B, 2A–B (see Note 2)	(16)
b) Upper division:	
1. Russ 101 (9 units), 118A–B	(15)
2. Russ 110, 148	(6)
2. General Education requirements	51
3. Electives, including other lower- and upper-division Russian courses, and remaining degree requirements (see *Degree Requirements*); may be used toward a dual major or a minor	36–52*
Total	124

* This figure takes into consideration the fact that 3 units of Russian 1A, 1B, or 2A–B may also be applied to General Education BREADTH Division 7 (see *General Education*). Consult a Russian major faculty adviser for details.

Notes:

1. *CR/NC* grading is not permitted for courses in the Russian major.
2. Russian majors who have studied Russian in high school or who by culture or experience can speak Russian at a certain level of proficiency must consult with a Russian adviser to determine which required lower-division courses, if any, may be waived. (Also see *Credit Allowance in Foreign Language.*) Russian majors who are able to enroll immediately in a Russ 1B or a 2A course are not required to make up units waived. Russian majors who are able to enroll immediately in Russ 2B or in an upper-division course must see a Russian adviser to determine the need to take an additional upper-division elective in the major.

Spanish Major

	Units
1. Major requirements (see Notes 1, 2 and 3)	30–44
a) Lower division: Span 1A, 1B, 2A, 2B, 3, 4A, 4B, 5 (see Note 3)	(14)
b) Upper division:	
1. Span 118 or 120, 122, 140, 170	(12)
2. Electives: (exclude Span 110T)	(18)
2. General Education requirements (see Note 2)	51
3. Electives: Remaining degree requirements and electives, including units to be used toward a dual major or minor	29–43*
Total	124

* This figure takes into consideration the fact that a maximum of two General Education BREADTH courses (6 units) from one department may be applied to satisfy Spanish major requirements (see *General Education*). These courses may be selected from Spanish 1A, 1B, 2A, 2B, 4A–B, 140 and 142 in General Education BREADTH Divisions 6 and 7. Consult a Spanish major faculty adviser for details.

Notes:

1. *CR/NC* grading is not permitted for courses in the Spanish major except for those taken Credit By Examination.
2. A maximum of two courses from one department may be used simultaneously to satisfy both the General Education BREADTH requirement and the major requirements.
3. Spanish majors who have studied Spanish in high school or who by culture or experience can speak Spanish at a certain level of proficiency must consult with a Spanish adviser to determine which lower-division courses, if any, may be waived. (Also see *Credit Allowance in Foreign Language.*) Spanish majors who are able to enroll immediately in Spanish 1B, 2A, 2B, 3, 4A, 4B, 5 or an upper-division Spanish course are not required to make up the lower-division units waived.

Minors

Depending on the specific minor, the student is responsible for 21–22 units. Consult a departmental adviser for planning your program.

Armenian

A minor with strong language concentration is offered under Armenian Studies.

French

	Units
Lower-Division Courses	6–9
Upper-Division Courses	12–15
	21

German

Germ 2A, 2B	0–6
Germ 50	3
Germ 101	3
German electives, upper division	9–15
	21

Greek

See *Classical Studies.*

Latin

See *Classical Studies.*

Russian

Russ 1A, 1B, 2A-B	16
Russ 101	6
	22

Spanish

Elect from Span 2A, 2B, 3, 4A–B, 5	0–9
Spanish electives, upper division	12–21
	21

Students interested in careers in translation are advised to take the following courses: Spanish 115 and 116. Those interested in interpreting should contact the department.

Credential Program

For Bilingual/Cross-Cultural Credentials, see *Education — Teacher Education Department,* and *Bilingual/Cross-Cultural Specialist Credential.*

The Single Subject Waiver Program in French consists of Fren 101, 102, 109, 120T, 132, 150, 160T; and 9 units selected from Fren 110, 111, 112, 113.

The Single Subject Waiver Program in German consists of Germ 101 (6 units), 103T (3–6 units), 137, 150; and 12–15 units selected from Germ 112, 114, 116, 118A–B, 135, 160T. Total required: 30 units.

The Single Subject Waiver Program in Spanish consists of Span 113, 118, or 120, 122, 123, 125, 137, 140, 170; and 6 units selected from Span 115, 116, 139, 142, 143, 145, 147, 150.

Graduate Program

The Master of Arts degree is granted in Spanish. Students interested in graduate study in French and German see the options under the Master of Arts degree in linguistics. The Master of Arts degree program in Spanish language and literature is designed to intensify and extend the knowledge of students desiring further study beyond the baccalaureate degree, students desiring their first graduate degree in anticipation of advanced graduate study, and teachers in secondary schools and colleges. For specific requirements consult the departmental graduate committee chair; for general requirements, see *Division of Graduate Studies and Research.*

Master of Arts Degree (in Spanish) Requirements

The Master of Arts degree program in Spanish assumes preparation equivalent to a CSU, Fresno undergraduate major in Spanish.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Project.*)

Under the direction of a graduate adviser, each student prepares and submits a coherent program individually designed within the following framework:

	Units
Span 201, 202	6
Span 217, 220, 230, 240	6–24
Span 298 or 299 (see Program Options below)	0–6
Approved upper-division Spanish electives (must include Span 142 and 143 if not previously taken)	0–12
Approved electives in related fields	0–3
Total	30

Program Options: Plan *A* (Thesis Program), Span 299 (6 units). Plan *B* (Project Program), Span 298 (6 units). Plan *C,* successful completion of a comprehensive examination.

Students who intend to go on to a Ph.D. program at another institution are strongly advised to study at least one other foreign language.

COURSES

Armenian (Arm)

1A. Elementary Armenian (4). Beginning course in conversational and written Armenian. Not open to students with one year or more of high school Armenian credit. General Education BREADTH, Division 7. (Former Arm 1A–B)

1B. Elementary Armenian (4). Prerequisite: Arm 1A or permission of instructor. Second semester course in conversational and written Armenian. Not open to those with two years or more of high school Armenian credit. General Education BREADTH, Division 7. (Former Arm 1A–B)

2A–B. Intermediate Armenian (4–4). Prerequisite: Arm 1A–B. Grammar review; selected readings; compositions and conversations on assigned topics; pronunciation drill. General Education BREADTH, Division 7.

111. Composition and Conversation (3). Prerequisite: Arm 2B. Idioms, written translations in Armenian, compositions on assigned topics, oral exercises. Emphasis on grammar and syntax.

112. Advanced Composition and Conversation (3). Prerequisite: Arm 111. Style in composition; written and oral reports on assigned topics.

148. Masterpieces of Armenian Literature (3). Literary masterpieces of Armenian Literature read and studied in English translation. May include works by Naregatsi, Toumanian, Charentz, Zarian, Siamanto, Varoujean and other important literary figures. General Education BREADTH, Division 6. (Former Arm S 50T section)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

Chinese (Chin)

See *Linguistics Department.*

Foreign Language (FL)

10. Critical Thinking: A Literary Approach (3). Introduction to critical thinking concepts (structuring an argument, avoiding common fallacies, distinguishing fact from belief, etc.) as manifested in European literature since the Renaissance. Also application of tools of critical analysis to talking and writing about literature. Taught in English. General Education CORE, Critical Thinking.

131. Trends in Foreign Language Teaching (3). Current trends and issues in foreign language teaching. Evaluation of recent teaching materials. May include on-campus practice in teaching beginning languages.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

French (Fren)

1A. Elementary French (4). Beginning course in conversational and written French. Not open to students with one year or more of high school French credit. General Education BREADTH, Division 7. (Former Fren 1A–B)

1B. Elementary French (4). Prerequisite: Fren 1A or permission of instructor. Second semester course in conversational and written French. Not open to those with two years or more of high school French credit. General Education BREADTH, Division 7. (Former Fren 1A–B)

2A. French for Communication (3). Intended for those with two years of high school French. Second year course that emphasizes speaking and reading skills. General Education BREADTH, Division 7. (Former Fren 2)

2B. French for Communication (3). Intended for those with three years of high school French. Second year course that emphasizes speaking, reading and writing skills. General Education BREADTH, Division 7. (Former Fren 3)

4. Reading and Writing (3). Prerequisite: Fren 1B, 2A or 2B. Opportunity to increase reading and writing skills in preparation for upper division coursework in French.

5. Conversation (3; max total 6). Prerequisite: Fren 1B. May be taken concurrently with Fren 2, 3 or 4. Development of listening and speaking skills. Exclusive use of French in an informal class atmosphere. Conversations on assigned topics, extemporaneous discussions.

AREA I. LANGUAGE AND CULTURE

101. Advanced Composition (3). Prerequisite: two semesters of Intermediate French. Written assignments in French on varied topics with emphasis on composition. Written exercises in French on specific points of grammar. (Fall semester)

102. Translation (3). Prerequisite: Fren 101. Problems and techniques of translation from English into French and French into English. Materials to be translated taken from the fields of science, literature, economics and politics. (Spring semester)

120T. Topics in French Civilization (3; max total 6 if no topic repeated). Prerequisite: two semesters of Intermediate French. Possible topics: French contributions to Western Civilization (art, music, architecture, history, science). Special emphasis on contemporary France. The history of Anglo-French and Franco-American relations. Linguistic, cultural, intellectual, political, commercial and diplomatic similarities and differences explored. Taught in French.

132. French Phonology and Structural Analysis (3). Prerequisite: Fren 101 or 102. As a progression toward mastery, an investigation of the French language as a functioning code of verbal communication. Relationships of oral/written aspects and contrasts with American English. Intensive drill on individual pronunciation problems.

150. Advanced Conversation (3). Prerequisite: two semesters of Intermediate French. Intensive practice in oral expression in French. Emphasis on current affairs in France.

AREA II. LITERATURE

109. Introduction to French Literature (3). Prerequisite: two semesters of Intermediate French. Intellectual background of major literary movements and representative authors from the earliest period to the present. Selected readings. Taught in French. General Education BREADTH, Division 6. (Fall semester)

110. French Theater (3). Prerequisite: Fren 109. Drama in France from the Renaissance to the present, with emphasis on the 17th and 20th centuries. Reading and discussion of representative works.

111. The French Novel (3). Prerequisite: Fren 109. The novel as a reflection of French society. Analysis of major works from various periods.

112. French Prose: Essay and Short Story (3). Prerequisite: Fren 109. Analysis of prose works by such authors as Montaigne, Voltaire, Maupassant, Camus, Sartre.

113. French Poetry (3). Prerequisite: Fren 109. Introductory course in poetry as a genre; principles of French versification. Students will be exposed to major contributions of the French in poetry. Thematic and/or chronological presentations (movements, "isms").

148. Masterpieces of French Literature (3). Literary masterpieces of French literature read and studied in English translation. May include works by Moliere, Voltaire, Balzac, Hugo, Camus and other important literary figures. General Education BREADTH, Division 6. (Former Fren 147)

149. Voices of Africa (3). Study of representative works by such writers as Achebe, Senghor and Mphahlele which reveal the attitudes of modern Africans toward their land, their traditions, and their encounter with the 20th Century world. Course taught in English. General Education CAPSTONE Cluster, Critical Thinking.

160T. Selected Topics in French Studies (1–3; max total 6 if no topic repeated). Topics chosen from French literature (genre, themes, movements), from French linguistics (History of the Language; Contrastive Analysis: English/French), or French Culture and Civilization.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES *(Fren)*

(See *Course Numbering System.*)

211. Historical Linguistics (3). Prerequisite: 24 upper-division units in French. History of the phonological, morphological, syntactical, and lexical development of the French language from its origins to the present, through study of representative texts.

212. Comparative Synchronic Linguistics (3). Prerequisite: undergraduate major. Language learning problems as seen through comparison of the structure of American English and French.

220T. Seminar in French Literature (3; max total 9 if no topic repeated). Prerequisite: 24 upper-division units in French.

250. Directed Reading (3; max total 6). Prerequisite: 24 upper-division units in French. Approved for *SP* grading.

290. Independent Study (3; max total 6). See *Academic Placement — Independent Study.* Approved for *SP* grading.

299. Thesis (2–6; max total 6). Prerequisite: *See Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

COURSES

German (Germ)

1A. Elementary German (4). Beginning course in conversational and written German. Not open to students with one year or more of high school German credit. General Education BREADTH, Division 7. (Former Germ 1A–B)

1B. Elementary German (4). Prerequisite: German 1A or permission of instructor. Second semester course in conversational and written German. Not open to those with two years or more of high school German credit. General Education BREADTH, Division 7. (Former Germ 1A–B)

2A–B. Intermediate German (3–3). Prerequisite: Germ 1B. Grammar review; reading and conversation. May be taken concurrently with German 50. General Education BREADTH, Division 7.

8T. Selected Topics in German (1; max total 2). Prerequisite: Germ 1A. Language experience outside classroom is stressed in oral topics. Problem vocabulary and grammar topics. *CR/NC* grading only.

50. Conversation (3; max total 6). Prerequisite: Germ 1B. Conversation on assigned topics; brief talks by students; short scenes from plays. (Spring semester)

101. Composition (3; max total 6). Prerequisite: Germ 2B. Idioms; written translations in German; compositions on assigned topics; oral exercises. Emphasis on grammar and syntax. (Fall semester)

103T. Topics in German Culture (3; max total 6 if no topic repeated). Prerequisite: Germ 2B. Studies in principal aspects of German culture and civilization, history, thought, customs, institutions.

112. German Literature to 1750 (3). Prerequisite: Germ 2B. Lectures and discussions; selected readings.

114. Classical Age of German Literature (3). Prerequisite: Germ 2B. Reading and discussion of representative writings of Lessing, Goethe and Schiller.

116. Nineteenth Century Literature (3). Not open to students with credit in 116A–B. Prerequisite: Germ 2B. Reading and discussion of representative selections from major 19th Century German authors.

118A–B. Twentieth Century Literature (3–3). Prerequisite: Germ 2B. Analytical and critical study of twentieth century literary production of Germany. Discussion and short reports.

135. History of the German Language (3). Prerequisite: Germ 2B. Development of the German Language from earliest times to the present.

137. Applied Linguistics (3). Prerequisite: Germ 2B. Analysis of the phonological, morphological, syntactical and lexical structure of German; conflicts with English structure; linguistic problems.

145. Introduction to German Literature (3). Prerequisite: Germ 2B. Selected readings from those literary works most representative of German culture in its development from the time of the Nibelungenlied to the present.

148. Masterpieces of Germanic Literature (3). Masterpieces of German, Austrian, Swiss and Scandinavian literature read and studied in English translation. May include works by Goethe, Kafka, Mann, Brecht, Strindberg and other important literary figures. General Education BREADTH, Division 6. (Former Germ 146T section)

150. Advanced Conversation (3). Prerequisite: Germ 2B. Intensive practice in oral expression in German. Emphasis on current affairs in Germany.

160T. Selected Literary Topics (1–3; max total 12 if no topic repeated). Prerequisite: Germ 2B. Intensive study of significant topics through selected literary texts; analysis, discussion, and evaluation of specific genres, themes, movements and literary problems.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES *(Germ)*

(See *Course Numbering System.*)

220T. Seminar in Literature (3; max total 12 if no topic repeated). Prerequisite: completion of an undergraduate major in German. Study of an aspect of literary history: genre, period, movement or individual author.

240T. Seminar in Germanic Languages (3; max total 12 if no topic repeated). Study of older Germanic languages and special linguistic problems.

290. Independent Study (1–3). See *Academic Placement — Independent Study.* Approved for *SP* grading.

COURSES

Greek (Grk)

1A–B. Elementary Greek (3–3). Fundamentals of Classical and New Testament Greek with practice in the reading and writing of the Greek language. General Education BREADTH, Division 7.

3A. Introduction to Modern Greek (3). Beginning course in conversational and written modern Greek. Not open to students with one year or more of high school Modern Greek credit. General Education BREADTH, Division 7. (Former Grk 3A–B)

3B. Introduction to Modern Greek (3). Prerequisite: Grk 3A or permission of instructor. Second semester course in conversational and written Modern Greek. Not open to those with two years or more of high school Modern Greek credit. General Education BREADTH, Division 7. (Former Grk 3A–B)

10. The Rise of Rationalism: 5th C. Athens (3). The origins of argumentation, logic, rhetoric, inductive thinking and the role of literature in 5th C. Athens, as reflected in selections from Plato, Thucydides, Euripides and the orators. Discussions and lectures. Conducted in English. General Education CORE, Critical Thinking.

131T. Greek Literature (3; max total 9 if no topic repeated). Prerequisite: Grk 1B. Concentration on a major Classical Greek poet or prose author. Translation and discussion. Research reports on literary, historical and textual problems.

148. Greek Literature in English Translation (3). Analysis of selected works of major Greek poets, writers and thinkers from Homer to Lucian. Lectures, discussions, reports on readings. General Education BREADTH, Division 6.

190. Independent Study (1–3). See *Academic Placement — Independent Study.* Approved for *SP* grading.

Hebrew (Hebr)

See *Linguistics Department.*

Italian (Ital)

1A. Elementary Italian (4). Beginning course in conversational and written Italian. Not open to students with one year or more of high school Italian credit. General Education BREADTH, Division 7. (Former Ital 1A–B)

1B. Elementary Italian (4). Prerequisite: Ital 1A or permission of instructor. Second semester course in conversational and written Italian. Not open to those with two years or more of high school Italian credit. General Education BREADTH, Division 7. (Former Ital 1A–B).

2A–B. Intermediate Italian (3–3). Prerequisite: Ital 1B or permission of instructor. Opportunity to build upon previously acquired knowledge of fundamental structures of Italian. Designed for students with one year of college Italian or high school equivalent. General Education BREADTH, Division 7.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

Japanese (Japn)

See *Linguistics Department.*

Latin (Latin)

1A–B. Elementary Latin (3–3). Elements of Latin grammar with its practical relation to Romance languages and English. Background study: Roman culture and its relevancy to the Western world. General Education BREADTH, Division 7.

131T. Latin Literature (3; max total 9 if no topic repeated). Prerequisite: Latin 1B. Concentration on a major Latin poet or prose author. Translation and discussion. Research reports on literary, historical and textual problems.

132. Classical Mythology (3). Greco-Roman myths, emphasis on their impact on the fine arts and literatures of the Western World. Illustrated lectures. Taught in English. General Education CAPSTONE Cluster, Critical Thinking.

148. Roman Literature in English Translation (3). Analysis of selected works of major Roman authors from Plautus to St. Augustine. Lectures, discussions, readings. General Education CAPSTONE Cluster, Critical Thinking.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

Portuguese (Port)

1A. Elementary Portuguese (4). Beginning course in conversational and written Portuguese. Not open to students with one year or more of high school Portuguese credit. General Education BREADTH, Division 7. (Former Port 1A–B)

1B. Elementary Portuguese (4). Prerequisite: Port 1A or permission of instructor. Second semester course in conversational and written Portuguese. Not open to those with two years or more of high school Portuguese credit. General Education BREADTH, Division 7. (Former Port 1A–B)

Russian (Russ)

1A. Elementary Russian (4). Beginning course in conversational and written Russian. Not open to students with one year or more of high school Russian credit. General Education BREADTH, Division 7. (Former Russ 1A–B)

1B. Elementary Russian (4). Prerequisite: Russ 1A or permission of instructor. Second semester course in conversational and written Russian. Not open to those with two years or more of high school Russian credit. General Education BREADTH, Division 7. (Former Russ 1A–B)

2A–B. Intermediate Russian (4–4). Prerequisite: Russ 1B as determined by examination. (A) Review of grammar and syntax; composition; oral practice; reading of short stories. (B) Oral and written composition. Conducted in Russian. General Education BREADTH, Division 7.

101. Composition and Conversation (3; max total 9). Prerequisite: Russ 2B. Continuation of prose composition and oral-aural practice for mastery of the finer points in grammar and syntax.

102. Advanced Conversation (3). Prerequisite: Russ 2B. Oral conversational practice on assigned topics relevant to Russian life and culture. To include brief talks, discussions and presentations.

103T. Topics in Russian Culture (3; max total 9 if no topic repeated). Credit may not be applied to Russian major and minor requirements. Sections designated as emphasizing Russian-Soviet culture and Socialist realism, Russian folk arts and folklore. Lectures illustrated with films and other audio-visual media. Taught in English.

110. Landmarks in Russian Literature (3). Chronicles, Byliny, Tales, Kievan Literature, Moscovite Literature, the Petrine Epoch, the Epoch of Catherine II and the rise of the 19th century literary Giants.

118A–B. Twentieth Century Literature (3–3). Prerequisite: Russ 2B. Analytical and critical study of the 20th century literary production of Russia. Outside readings.

127T. Soviet Russian Topics (3; max total 9 if no topic repeated). Sections designated as emphasizing landmarks in Russian literature. Russian underground, protest and emigre works. Lectures illustrated with films and other audio-visual media. Taught in English.

148. Masterpieces of Russian Literature (3). Literary masterpieces of Russian literature read and studied in English translation. May include works by Pushkin, Tolstoy, Dostoyevski, Solzhenitzyn, Pasternak, Sholokhov and other important literary figures. General Education BREADTH, Division 6. (Former Russ 148A–B)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

Spanish (Span)

1A. Elementary Spanish (4). Beginning course in conversational and written Spanish. Not open to students with one year or more of high school Spanish credit. General Education BREADTH, Division 7. (Former Span 1A–B)

1B. Elementary Spanish (4). Prerequisite: Span 1A or permission of instructor. Second semester course in conversational and written Spanish. Not open to those with two years or more of high school Spanish credit. General Education BREADTH, Division 7. (Former Span 1A–B)

2A. Spanish for Communication (3). Intended for those with two years of high school Spanish. Second year course that emphasizes speaking and reading skills. General Education BREADTH, Division 7. (Former Span 2A–B)

2B. Spanish for Communication (3). Intended for those with three years of high school Spanish. Second year course that emphasizes speaking, reading and writing skills. General Education BREADTH, Division 7. (Former Span 2A–B)

3. Reading and Writing (3). Prerequisite: Span 1B, 2A or 2B. Opportunity to increase reading and writing skills in preparation for upper-division coursework in Spanish.

4A–B. Spanish for the Bilingual Student (3–3). For students with a bilingual background. Emphasis on reading and writing, some grammar review and conversation. General Education BREADTH, Division 7.

5. Spanish for Conversation (3). Prerequisite: Span 1B. Emphasis on spoken Spanish; development of oral fluency through class discussion, conversation games and vocabulary exercises.

8T. Fundamental Skills in Spanish (1–2; max total 4 if no topic repeated). Instruction in fundamental problems in writing and word usage, such as accentuation, spelling and vocabulary. Intended primarily for students who need more work in specific areas of writing and speaking. *CR/NC* grading only.

AREAS I–V PREREQUISITE: Spanish 3 or 4B

AREA I. BILINGUAL STUDIES

104. Spanish in Bilingual Schools (3). Prerequisite: Span 118 or 120, and 122. Emphasis on Spanish language development for bilingual teachers at the elementary level. Presentation of specialized vocabulary in teaching elementary courses. Development and evaluation of bilingual teaching materials in Spanish.

106T. Children's Literature in Spanish (3). Prerequisite: Span 2A, 2B or 4A–B. Examination of children's stories, poems, rhymes and songs written, composed or available in Spanish. Practice in the techniques of story-telling. Dramatizations of children's stories in Spanish. Presentation of puppet plays.

AREA II. LANGUAGE AND TRANSLATION

110T. Practical Spanish for Professions (3; max total 12 if no topic repeated). Applicable for minor. Preparation of professionals and paraprofessionals in California Spanish to work with the Spanish speaking in the following fields: health, education, social work, business, law, agriculture and psychology.

112. Reader's Theater in Spanish (3). Prerequisite: Span 2A, 2B or 4A–B. Dramatic readings of prose and poetry selections performed by students in front of the class. Discussion focuses on a critical reading of the text and preparation of the performance. Public presentations and recordings optional.

113. Patterns of Spanish (3). Prerequisite: Span 2A, 2B or 4A–B. Recommended as the first upper-division course. Verb synonyms. Quantitative and qualitative usage of verbs. Acquisition of the following skills: narration, description, argumentation and expression of feelings through syntactical variations and substitution of verbs. Attention is focused on the formation of a sentence not on the composition of a paragraph.

115. Basic Principles of Translation (3). Prerequisite: Span 2A, 2B or 4A–B. Specific problems of Spanish to English and English to Spanish translation, with emphasis on idiomatic expressions. Some attention to specialized vocabulary. Use of bilingual dictionaries.

I encourage students to travel, to leave their hometowns and live with other people.

Shien-min Jen
Professor and Chair, Anthropology

116. The Art of Translation (3). Prerequisite: Span 2A, 2B or 4A–B. Not open to students with credit in Span 116A–B. Mini-projects dealing with the differences between oral and written styles, idioms, metaphors, slang, technical vocabulary, as well as structural and semantic factors.

118. Spanish Composition for Bilinguals (3). Prerequisite: Span 4A–B. Not open to students with credit in Span 120. Refinement of writing skills through vocabulary development, spelling exercises and composition. Special emphasis on problems created by differences between the spoken and written language.

120. Composition and Reading (3). Prerequisite: Span 2A, 2B or 4A–B. Not open to students with credit in Span 118. Development and refinement of writing skills. Intensive practice in expository and imaginative composition. Analysis of original compositions with attention to common problems of accentuation, spelling and grammar.

122. Advanced Grammar (3). Prerequisite: Span 2A, 2B or 4A–B. Special emphasis on grammar review and development of writing skills. Analysis of grammatical constructions.

123. Advanced Conversation and Reading (3). Prerequisite: Span 2A, 2B or 4A–B. Reading and discussion of current periodicals, newspapers and magazines that reflect the cultural patterns of the Spanish-speaking countries.

AREA III. HISPANIC CULTURE

125. Hispanic Culture (3). Prerequisite: Span 2A, 2B or 4A–B. Examination of the cultural patterns of Spain and Spanish America through readings, lectures, films and other media. Frequent written and oral reports by students.

AREA IV. SPANISH LINGUISTICS

137. Applied Spanish Linguistics (3). Prerequisite: Span 2A, 2B or 4A–B. Analysis of Spanish with emphasis on areas of phonetics, pronunciation and grammar which cause the greatest problems in learning and teaching the language. Readings and practice in the development of instructional strategies and materials.

139. Spanish of the Southwest (3). Prerequisite: Span 2A, 2B or 4A–B. Research on dialect differences in California and the Southwest, including the linguistic, social and cultural determinants. Emphasis on the Spanish of the San Joaquin Valley.

AREA V. HISPANIC LITERATURE

140. Hispanic Fiction and Poetry (3). Prerequisite: Span 2A, 2B or 4A–B. Readings and appreciation of Hispanic literature to familiarize the student with the fiction and poetry as art forms. General Education BREADTH, Division 6.

142. Introduction to Spanish Literature (3). Prerequisite: Span 2A, 2B or 4A–B. Selected readings from those literary works which have fundamentally affected the development of Spanish civilization, from El Cid to Lorca. Provides a historical framework for the study of Spanish literature. General Education BREADTH, Division 6.

143. Introduction to Spanish-American Literature (3). Prerequisite: Span 2A, 2B or 4A–B. Selected readings from those literary works which have fundamentally affected the development of Spanish American civilization, from Hernán Cortés to Octavio Paz. Provides a historical framework for the study of Spanish American literature.

145. Mexican Literature (3). Prerequisite: Span 2A, 2B or 4A–B. Study of the works of such major Mexican literary figures as Sor Juana, Gutiérrez Nájera, Azuela and Fuentes.

146. Masterpieces of Spanish Literature (3). Major literary masterpieces of Spanish and Latin American literature read and studied in English translation. May include Cervantes, Lorca, Neruda, Fuentes, Borges and other important literary figures. Not applicable to Spanish major. General Education BREADTH, Division 6.

147. Twentieth Century Spanish-American Literature (3). Prerequisite: Span 2A, 2B or 4A–B. Intensive study of selected Spanish-American works including writings of Azuela, Fuentes, Carpentier, Vargas Llosa; outstanding poets such as Neruda, Vallejo and Paz.

148T. Major Figures in Hispanic Literature (3; max total 6 if no topic repeated). Prerequisite: Span 2A, 2B or 4A–B. Reading and analysis of the works of one major Hispanic author such as Cervantes, Unamuno, Neruda.

149. The Golden Age (3). Prerequisite: Span 2A, 2B or 4A–B. A study of Spanish Renaissance Man and his environment. His socio-political, esthetic and literary ideas are studied through readings in Garcilaso, San Juan de la Cruz and other authors. (Former Span 149T)

150. Twentieth Century Spanish Literature (3). Prerequisite: Span 2A, 2B or 4A–B. A study of Spanish Existential Man. His socio-political, esthetic and literary ideas are studied through readings in Unamuno, Ortega y Gassett, Lorca, José Hierro and other authors. (Former Span 150T)

170. Senior Seminar in Spanish Studies (3). Prerequisite: twenty upper-division units of Spanish coursework or graduate standing. Designed to meet the individual needs of students about to graduate. Diagnostic testing in language, linguistic, cultural and literary proficiency. Readings, research projects and assignments.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES *(Span)*

(See *Course Numbering System.*)

201. History of the Spanish Language (3). History of the Spanish language from Latin to present. Influences from other languages. Special emphasis on development of sounds, structures and vocabulary where they provide insight into the modern language and dialects. Readings from medieval literature.

202. Literary Criticism (3). Discussion and application of methods and techniques in research. Analysis and application of the methods of literary criticism with consideration given to critical approaches in Spain and Spanish America.

217. Spanish Translation (3–6; max total 6). Prerequisite: Span 116 or permission of instructor. Advanced work in the field of translation. Attention to the translation of public documents, particularly in the areas of government, business and law, as well as translation of literary works.

220T. Hispanic Linguistics (3; max total 9 if no topic repeated). In-depth analysis of the Spanish language through the study of the following areas: diachronic linguistics, synchronic linguistics and dialectology.

230T. Spanish Literature (3; max total 9 if no topic repeated). Seminar in critique and analytical study of selected topics, genres or specific literary figures in each of the following areas: Medieval Period, Renaissance Period, Golden Age, 18th–19th Century and 20th Century.

240T. Spanish-American Literature (3; max total 9 if no topic repeated). Seminar in critique and analytical study of selected topics, genres or specific literary figures in each of the following areas: Colonial Period to 1810, 19th Century to 1910, 20th Century.

290. Independent Study (2–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

298. Project (3–6; max total 6). See *Criteria for Thesis and Project.* Writing and/or editing materials suitable for school programs from elementary through high school level, such as children's literature, original poetry, testing devices and translations. Approved for *SP* grading.

299. Thesis (3–6; max total 6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the completion of the master's degree. Approved for *SP* grading.

IN-SERVICE COURSES *(Span)*

(See *Course Numbering System.*)

301. Conversation and Composition Review (2; max total 8 if no language repeated). For elementary and secondary school teachers or those planning to travel abroad. Prerequisite: bachelor's degree or teaching credential; permission of instructor. Conversation and composition to improve audio-lingual and writing skills in the foreign language.

304. Theory and Practice (2; max total 8). Prerequisite: permission of instructor. Not open to students with credit in two or more years of college Spanish. Basic elements of the language; modern methods of foreign language instruction in the elementary school; repeatable in sequence — pronunciation, methods, phonetics, advanced methods.

Geography

School of Social Sciences
Department of Geography
James S. Kus, Chair
Science Building, Room 182
(209) 278-2797

B.A. in Geography
Minor in Geography
M.A. in Geography

Geography is an integrative discipline that bridges the natural and social sciences. Its distinctiveness is as much a product of its unique approach to the study of the earth and its human inhabitants as it is the subject matter itself. Thus, geography employs a spatial framework for organizational purposes analogous to the chronological framework employed in history.

Central to geographic inquiry is a concern with the human occupance of the earth, the character of the human environment, and the interrelationships that link humans and the physical world. In sum, geography seeks to provide a broad understanding of the world, its people and its problems.

Not surprisingly, the subject matter of geography is diverse. Geographers examine and analyze patterns of rural and urban settlement, resource exploitation, land use, social and cultural phenomena. They are concerned with the natural features and processes of the earth's surface, the ways in which nature has conditioned the human occupance of the earth, and the ways in which people have modified natural landscapes.

The department's instructional programs are designed to address several objectives. First, for the larger number of our students, we provide a greater understanding of the world as an element of a liberal education. Second, we conduct programs for majors and minors in geography that assure a breadth of knowledge in subject matter and technique. Third, we serve those students in related disciplines who wish to strengthen programs of study through a selection of courses in geography.

Faculty and Facilities

Instruction at introductory, advanced and graduate levels is conducted by a faculty whose teaching and research interests are diverse. All major facets of the discipline are represented as are a number of specializations.

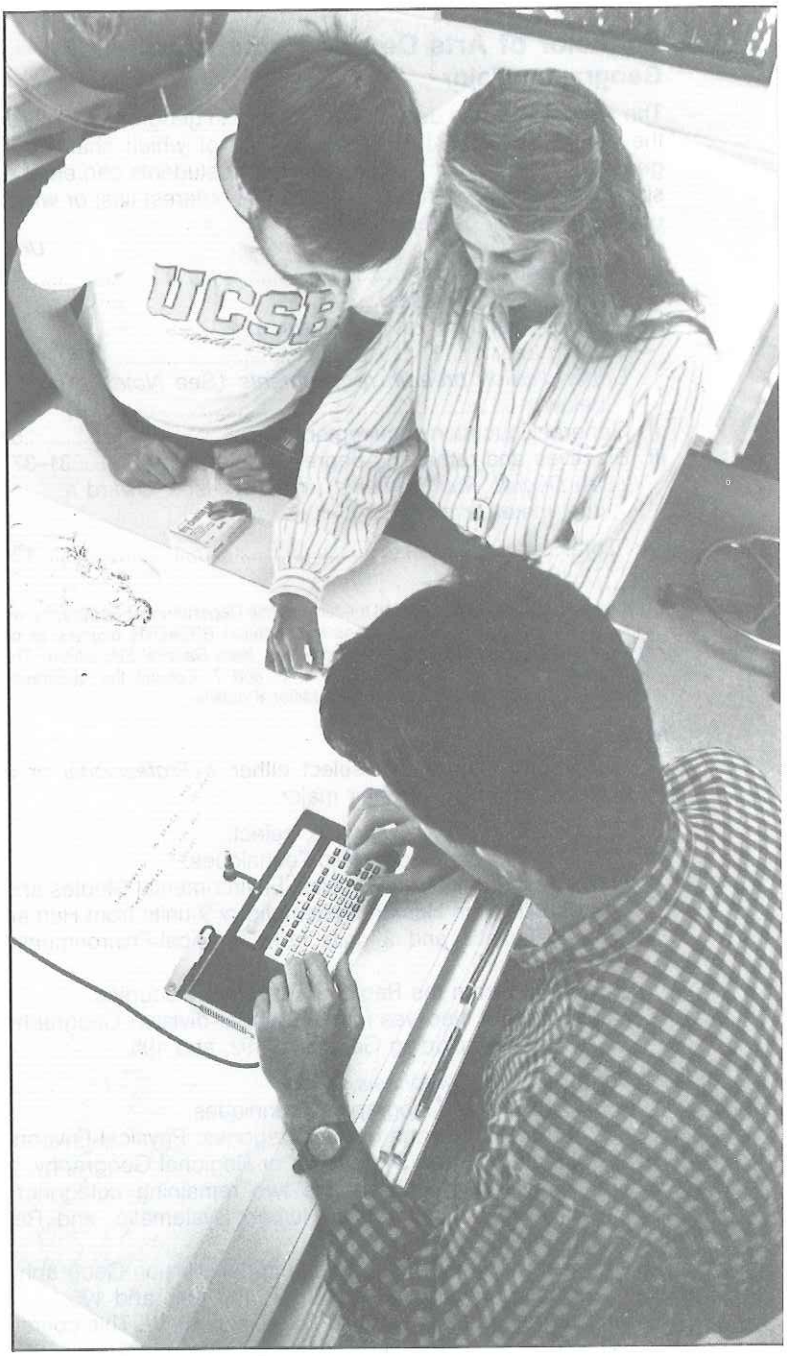
A variety of facilities is available for student use. Well-equipped laboratories are maintained for the conduct of research and instruction in physical geography and the technique fields — cartography, air photo interpretation and remote sensing, meteorological instrumentation, and quantitative analysis. The department also operates a fully-equipped weather and pollution monitoring station.

Computers are available for mapping and a variety of other applications. The department is well-equipped for field work.

Career Opportunities

Geographers are employed in government and the private sector. Their knowledge and skills have applications in a variety of fields including teaching, planning, cartography, locational analysis, intelligence and security, land and resource management, policy research, transportation, and industrial development.

Agencies of federal, state and local governments are major employers of geographers. At the federal level many agencies employ geographers. At state and local levels most geographers are involved in planning, land and resource management, and community development. Because many businesses and industries have important geographical dimensions to their operations, there is demand for geographers in the private sector. Geographers are employed in banking, transportation, international trade, utilities, wholesaling and retailing, and a number of other fields. Finally, teaching is a major occupation for individuals with training in geography. The department welcomes inquiries about career opportunities.



Faculty

James S. Kus, *Chair*

Michael J. Biechler
John A. Crosby
E. Frank Koller
Robert E. Lee
Donald L. Morgan
George N. Nasse
Stanley F. Norsworthy
Joyce A. Quinn
Jerry C. Towle
Paul Vander Meer

Stanley F. Norsworthy, *Graduate Adviser*
Robert E. Lee, *Undergraduate Adviser*

Bachelor of Arts Degree Requirements

Geography Major

The Bachelor of Arts degree with a major in geography requires the completion of 124 units, at least 42 of which shall be in geography. The major is so designed that students can emphasize that area in geography in which their interest lies; or which conforms to their career objectives.

	Units
I. Major requirements	42
Lower-division courses:	
Geog 5, 7, and two of the following:	
Geog 2, 3, 4	(12)
Upper-division breadth requirements (See *Notes* below):	(30)
II. General Education requirements	51
III. Electives and remaining degree requirements (See *Degree Requirements*); may be used toward a dual major or minor	31–37*
Total	124

* This figure takes into consideration the fact that the Department of Geography will allow a maximum of 6 units of General Education BREADTH courses to be applied to the Geography major requirements (see *General Education*). The applicable courses include Geog 2, 3, 4, 5, and 7. Consult the geography department chair or faculty adviser for additional details.

Notes:

1. Geography majors can select either a *Professional* or a *General* emphasis for their major.

   For the *Professional emphasis,* select:
   a. 9 units from Geographic Techniques.
   b. Either 9 units from Physical-Environmental Studies and 3 units from Human Systematic *or* 9 units from Human Systematic and 3 units from Physical-Environmental Studies.
   c. 3 units from the Regional Geography courses.
   d. 6 units of electives from the upper-division Geography classes, including Geog 190, 192, and 195.

   For the *General emphasis,* select:
   a. 3 units from Geographic Techniques.
   b. 12 units from one of the categories: Physical-Environmental, Human Systematic, or Regional Geography.
   c. 6 units from each of the two remaining categories: Physical-Environmental, Human Systematic, and Regional Geography.
   d. 3 units of electives from the upper-division Geography classes, including Geog 188T, 190, 192, and 195.
2. All Geography majors should take Geog 194W. This course will satisfy the writing skills requirement for graduation.
3. No more than 3 units of Geog 195 may be applied to the Geography major.
4. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy Geography major requirements.
5. *CR/NC* grading is not permitted in the Geography major with the exception of Geog 192 and 195.
6. General Education and elective units may be applied to a second major or a minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
7. It is strongly recommended that students interested in professional careers complete course work in quantitative methods and computer concepts (e.g., IS 50, 53, 54, ECE 70) and, if applicable, city and regional planning. Coursework in introductory geology is also recommended. Consideration should be given to the development of foreign language competency and/or the completion of a second major or a minor in a related discipline.
8. Students must regularly consult with their academic adviser. Such consultation will facilitate course selection and enable the student to develop a program consistent with individual interests and needs.
9. The selection of an emphasis will be strongly influenced by career goals, interests in graduate study and related matters. Whether one's interest focuses on environmental protection, planning, cartography, locational analysis or any one of a wide array of geographic competencies, the department can provide current applicable information. Inquiries are welcomed.

Geography Minor

	Units
Elect from Geog 2, 3, 4, 5, or 7	9
Elect from upper-division geography*	12
	21

* No more than 3 units earned in Geog 195 may be applied to the minor. Students completing a minor in geography are encouraged to seek faculty advice relative to course selection and program planning.

Credential Program

See *Social Science Major* for the Single Subject Waiver program in Social Science.

Graduate Program

The Department of Geography offers two programs leading to the master of arts degree in geography: Plan *A* — Thesis Program and Plan *B* — Non-Thesis Program. Plan *A* is a research-oriented program and is intended to give extended preparation for a person going into research-oriented geographic professions and serves as a preparation for additional graduate work leading to the doctorate. Plan *B* is designed to give a person a broad background in advanced geographic topics as preparation for nonresearch-oriented geographic professions.

Master of Arts Degree Requirements

The Master of Arts degree program in Geography assumes a B.A. degree in Geography or a closely allied field. It is recommended that cartography, field geography and quantitative techniques (statistics) (Geog 100, 109, and 110) be taken as technique courses at the undergraduate level.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements, Criteria For Thesis and Project.*)

For specific requirements consult the departmental graduate adviser; for general requirements see *Division of Graduate Studies and Research.*

Under the supervision of the departmental graduate adviser, each student submits an approved program within one of the following frameworks:

Plan A — Thesis Program

	Units
200-series courses in geography	18
Outside the field	3–6
Electives in geography	6–9
Total	30

Specific requirements: Geog 200; 206T; 270T; 203T or 260T; 299 (6 units).

Plan B — Non-Thesis Program

	Units
200-series courses in geography	18
Outside the field	3–6
Electives in geography	6–9
Total	30

Specific requirements: Geog 200; 206T; 270T; 203T or 260T. Terminal oral examinations.

COURSES

Introductory Geography (Geog)

2. Introduction to Cultural Geography (3). General background to cultural geography, including origins of cultural landscapes, man's modification of the natural environment, and problems of population and settlement geography. General Education BREADTH, Division 8. (CAN GEOG 4).

3. Economic Geography (3). Evolution and change in the location of major economic (agricultural, commercial, transportation, mineral, and industrial) activities. An examination of the diverse phenomena that influence the location of economic activities. General Education BREADTH, Division 8.

4. World Geography (3). Cultural and physical features; economic development; resources; man-land relationships. The approach is by continents and/or cultural regions. General Education BREADTH, Division 8.

5. Physical Geography: Global Concepts, Weather and Climate (3). The earth as a planet, map projections, location on the earth's surface, time, oceans, weather and climate. General Education BREADTH, Division 3.

7. Physical Geography: The Earth's Surface (3). A survey of those elements of the physical environment at the earth-atmosphere contact. Fundamentals of landform features, soils, natural vegetation and water bodies. General Education BREADTH, Division 3.

I try to educate my students to appreciate the splendor of the High Sierra, as well as teach them to leave nothing behind but their footprints and take nothing away but pictures and memories.

Donald L. Morgan
Professor, Geography

Techniques in Geographic Study (Geog)

100. Cartography (3). Introduction to the field. History of map-making, map projections, theory of map communication. Practical experience in compilation, generalization, symbolization, and design to produce original pen-and-ink drafted maps. Teaches the skill of presenting tabular data in map form. (two 3-hour labs)

102. Computer Assisted Cartography (3). Prerequisite: Geog 100 or permission of instructor. Practical course in map making using computers. Fundamental concepts and introduction to various software packages for map design and production. Digitizing, file structure, thematic maps, 3-D. No computer experience required. (6 lab hours) (Former Geog 188T section)

103. Computers in Geography (3). Introduction to computer applications in geography. Fundamental concepts of computers, wordprocessing, programming, data base, statistical analysis, computer mapping, remote sensing and GIS applications. No computer and statistical experiences required. (two 3-hour labs) (Former Geog 188T section)

104. Map Interpretation (3). Prerequisite: Geol 1 or Geog 7. Interpretation of foreign and domestic maps; symbols, scale, method of showing topography, vegetation, culture, land use, soils, water levels; characteristics of projections. (two 3-hour labs)

105. Aerial Photograph Interpretation (3). Prerequisite: Geol 1 or Geog 7. Aerial photographs as a means of determining culture, topography and vegetation; scale, use of index, vertical and oblique photographs, and stereoscopes. (two 3-hour labs)

106. Advanced Aerial Photo Interpretation and Remote Sensing of Environment (3). Prerequisite: Geog 105. Interpretation of air-borne and orbital imagery; panchromatic, color, infrared, color infrared, radar, multispectral. (two 3-hour labs)

109. Technical Field Geography (3). Gathering and analysis of rural land use data — crop distribution related to topography, climate, soils, water, markets; urban land use — delineation of central business district (CBD), foot and automobile traffic flows, housing quality, retail and wholesale trade territories, population concentrations and ethnic groupings. (4–8 field hours)

110. Basic Quantitative Techniques (4). Quantitative techniques applied to problems in geography. Small hand calculator required. A mini-computer will be used in some laboratory exercises. No prior knowledge of statistics is assumed. (3 lecture, 3 lab hours)

Physical-Environmental Studies (Geog)

111. Meteorology (4). Prerequisite: Geog 5 or equivalent. Study of the earth's atmosphere; energy exchanges and temperature; pressure and air circulation; fog, clouds, precipitation and the hydrologic cycle; cyclonic storms and orographic processes; stability and thunderstorms; weather modification and predictions with application to agriculture, aviation, and other activities. (3 lecture, 3 lab hours)

112. World Climates (3). Prerequisite: Geog 5 or 111. Study of various systems of climate classification. Climates as they exist throughout the world and the reasons for their occurrence.

114. Microclimatology (3). (Same as Plant 134). Prerequisite: Geog 5 or equivalent. Micrometeorological influences on local climates including natural ecosystems and varying argicultural canopies. Local climate influences on wildlife, domestic animals and humans. Manipulation of local climate including frost protection, irrigation and wind sheltering. Microclimates of non-uniform terrain and urban environment.

117. Plant Geography (3). Study of earth's plant cover; world floras; dispersal and migration; environmental effects on distributions; plant communities; major vegetation regions.

118. Soils Geography (3). Properties of soil, factors of soil genesis, soil types of the world and their distribution, man's use of the soil.

120. World Landform Regions (3). A systematic analysis of types of world landform regions with emphasis on glaciated regions, arid lands, and volcanic lands.

121. United States Landform Regions (3). Prerequisite: Geog 120 or Geol 105. Natural regions of the United States based on study of types of landforms. Analysis of unity and diversity in such landform regions as the Colorado Plateau, Sierra Nevada Province, Basin and Range, et al.

128. Environmental Pollution (3). A discussion of current environmental pollution problems involving the atmosphere, land, and water. The adverse effects of transportation, surface mining, sewage and waste disposal, noise, the use of pesticides, energy production and consumption, and related topics are examined. General Education CAPSTONE Cluster.

132. Geography of Natural Resources (3). Study of the spatial distributions and relationships of natural resources, including land, water, minerals, plants, and animals; form, inherent characteristics, and external relations with the regions in which they are found; use and misuse.

135. The Protection of Nature (3). An examination of the plight of nature; the values of nature preserved; man's attempt to preserve nature. Attention focuses on the national park movement, wilderness, endangered species, the management of lands for the purpose of preservation, and related topics.

Human Systematic Geography (Geog)

127. Man's Modification of the Natural Environment (3). Ways in which man's activities have altered climate, landforms, soil and water conditions, and natural vegetation.

134. Geography of Energy (3). The world's energy resources emphasizing fossil fuels. The energy crisis. Alternative sources of energy: solar, nuclear, hydroelectric, geothermal, wind and tidal. General Education CAPSTONE Cluster, Critical Thinking.

146. Land Use (3). Principles and trends relating to the causes and effects of existing land use patterns throughout the world. Topics include climate and soils, trade, transport, and manufacturing systems; national and local policies, and human abuse.

147. Population Geography (3). Geographical analysis of the causes and consequences of global population growth, migrations, distributions, and relationships to natural resources.

150. Agricultural Geography (3). Analysis of areal distribution of agricultural (crops and livestock) patterns of the world. Interactions with the environment, role in economies.

152. Transportation Geography (3). Analysis of areal distribution of transport networks of the world (road, rail, water, and air) and the interaction of these networks with other phenomena.

160. Urban Geography (3). The city environment. An understanding of the changing urban environments from ancient through medieval to modern times; the relationship of the urban center to its surrounding hinterland; the interdependence of its functional parts; its problems and future. General Education CAPSTONE Cluster.

161. Historical Geography of the United States (3). Regional settlement of the United States; peopling of physiographic regions, creation of economic (cultural) regions, and geographic factors related to broad trends in American history.

162. Political Geography (3). Systematic treatment of the nature and structure of states, boundary problems, political policy for the oceans, international power, air space.

163. World Crises (3). Current major political, economic, and environmental crises occurring on either a global or a regional level.

164. Minority Peoples (3). Spatial analysis of minority groups in the world, in the United States, and in Central California. Historical and modern distribution of minority peoples, based on racial, ethnic, cultural, and economic characteristics.

165. Cultural Landscapes (3). Spatial aspects of the development of cultural landscapes, particularly the evolution of agriculture and urbanization. Emphasis on the cultural landscapes of Central California.

Regional Geography (Geog)

145T. Environmental Regions (1–3; max total 9, if no area repeated). Systematic and regional investigation of the physical and cultural complexes of various environmental regions. Regions to be discussed include the Humid Tropics, Arid Lands, Polar Lands, Coastal Lands, Mountain Environments, Island Environments.

166T. Anglo-American Regions (1–3; max total 9, if no area repeated). Examination of the physical, economic and cultural geographic foundations of major Anglo-American regions. Regions to be discussed include Canada, the United States, the American West, the South, the Middle West, and the North East.

168. Geography of California (3). Natural and cultural patterns of California; historical and regional geography of the state. General Education CAPSTONE Cluster, Critical Thinking.

170T. Latin American Regions (1–3; max total 9, if no area repeated). Geography of Latin America. Relationship of cultural and natural features; social and economic development; man-land relationships. Regions to be discussed include Mexico, Central America, Caribbean Islands and South America.

172. Ancient Peru (3). The geography of Ancient Peru. The physical landscape and human modification of that landscape over time. Emphasis on the origin of agriculture and the rise of urbanism in the Andean Region. General Education CAPSTONE Cluster, Critical Thinking. (Former Geog 170T section)

174T. European Regions (1–3; max total 9, if no area repeated). Geographic regions of Europe emphasizing the relation of human activities to physical factors areal in their distribution and influence. Regions to be discussed include Mediterranean lands, Western Europe, Eastern Europe, Central Europe, Northern Europe, the British Isles.

176. Geography of the USSR (3). Comprehensive study of the economic, cultural, physical and political geographic foundations of the Soviet state, followed by intensive study of selected regions within the country. General Education CAPSTONE Cluster.

177T. Asian Regions (1–3; max total 9, if no area repeated). Geographic regions of Asia emphasizing physical and cultural features. Regions to be discussed include Southeast Asia, South Asia, China, and the Far East.

179. Geography of the Middle East (3). Comprehensive study of the physical features of the Middle East and the cultural traits of its people. The area under consideration extends from the Turkish Straits to the Pamir Knot, and from the Caucasus to the Sudan.

180. Biblical Lands (3). The focus of this course is the area that spawned three of the world's great religions — Christianity, Judaism and Islam. A geographical approach is employed in describing and analyzing this cultural hearth. General Education CAPSTONE Cluster.

181T. African Regions (1–3; max total 9, if no region repeated). Study of major African regions relating to basic physical, cultural, economic, and political geographic conditions and problems. Regions to be discussed include Developing Black Africa, North Africa, West Africa, East Africa, Central Africa and Southern Africa.

182. Subsaharan Africa (3). Comprehensive study of the economic, cultural, physical and political geographic foundations of Subsaharan Africa. General Education CAPSTONE Cluster.

183T. Australia, New Zealand, and Pacific Islands (3). Geographic relationships of natural and cultural features to social and economic development. (Former Geog 183)

Geographic Topics, Research and Field Trips (Geog)

188T. Topics in Geography (1–3; max total 9). Selected topics in cultural, physical, and economic geography.

190. Independent Study (1–3; max total 6). See *Academic Placement — Independent Study*. Approved for *SP* grading.

192. Directed Readings (1–3; max total 6). Prerequisite: permission of instructor. Supervised readings in a selected field of geography. Combined units of Geog 190 and 192 may not exceed 6 units.

194W. History and Theory of Human Geography (3). Prerequisite: Engl 1. A survey of the development of human geography, with emphasis on twentieth-century geographic thought. Discussion of the major themes and approaches that have been dominant in this field at various times. Satisfies the upper-division writing requirement for graduation.

195. Field Geography (1–6; max total 6). Prerequisite: permission of instructor. Week-end, semester break, or summer field trips.

GRADUATE COURSES

(See *Course Numbering System*.)

200. Methods in Geographic Research and Writing (3). Prerequisite: permission of instructor. Bibliographic technique with emphasis on statistical, map, aerial photograph sources; research writing; preparation of manuscripts including illustrative material.

203T. Seminar in Economic Geography (3; max total 6 if no topic repeated). Prerequisite: permission of instructor. Theory, concepts, and methods in economic geography. Each offering will be chosen from the fields of transportation, industrial, agricultural or resource geography.

206T. Seminar in Physical Geography (3; max total 9). Prerequisite: permission of instructor. Principles, concepts, and theories in the systematic study of physical geography and its methodology. Each offering chosen from the fields of geomorphology, climatology, biogeography, water, or soils.

230. Seminar in Contemporary Geographic Thought (3). Prerequisite: permission of instructor. Current theories of geography and their evolution.

260T. Seminar in Human Geography (3; max total 9). Prerequisite: permission of instructor. Principles, concepts, and theories in the systematic study of a field of human geography and its methodology: political, cultural, urban, historical, or population and settlement geography.

270T. Seminar in Selected Regions (3; max total 12, if no region is repeated). Prerequisite: undergraduate course dealing with the region under study. Study of geographic conditions in relation to economic, social and political problems in a selected region of the world.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

292. Directed Readings in Geography (1–3; max total 6). Prerequisite: graduate standing. Supervised reading in a selected geographic topic.

299. Thesis (2–6; max total 6). Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

Geology

School of Natural Sciences
Department of Geology
Jon C. Avent, Chair
McLane Hall, Room 284
(209) 278-3086

B.S. in Geology
M.S. in Geology
Minor in Geology



Why geology? What is it?
Continents adrift and colliding
Energy resources and waste disposal
Fossils and evolution
Volcanoes and earthquakes
Mountain building and erosion
4.6 billion years of earth history

The Department of Geology at California State University, Fresno offers courses leading to Bachelor of Science and Master of Science degrees, as well as a minor in geology.

Coursework and research emphasize field and laboratory investigations of a wide variety of geologic problems. Our field orientation takes advantage of the university's close proximity to the Sierra Nevada, the California Coast Ranges, coastal California, and the Basin and Range province. This unique location gives faculty and students access to an unparalleled geologic laboratory all within one to five hours driving time from the university.

The Bachelor of Science degree is designed for students who wish to study geology in preparation for employment in petroleum geology, mineral exploration, land-use planning, hydrology and engineering geology, or for students who want to teach earth science or physical science at the secondary level. The Master of Science program is designed to provide a graduate degree for students who want to work in industry or government on the professional level, for students who want to teach earth science in junior college, or for students who wish to pursue further graduate study.

Six of the California State University and Colleges, including CSU, Fresno, cooperate in the management of the Moss Landing Marine Laboratories on Monterey Bay, an establishment which offers regular course work and opportunities for research which are applicable to graduate and undergraduate programs, including courses in geological oceanography. Consult the chairs of the geology and biology departments. See *Moss Landing Marine Laboratories; Biology Department.*

Facilities and Support

The Department of Geology is situated in a wing of the Science Building. Department equipment includes:

- X-ray fluorescence spectrometer.
- X-ray diffractometer.
- Polarizing microscopes for transmitted and reflected light petrography.
- Point-counting and universal stages.
- Cathode luminoscope for microscopic study of textures.
- Heating-freezing stage for microscopic study of fluid inclusions.
- Rock preparation laboratory, which includes crushing and mineral separation facilities, as well as diamond saws and lapping machines for preparation of thin and polished sections.
- Microcomputers and peripherals.
- Field and laboratory equipment for water chemistry studies.
- Teaching and reference collection of rocks, fossils, minerals, and maps.
- Two four-wheel drive vehicles and three other field vehicles.

Equipment available elsewhere on campus includes:

- CYBER, VAX AND PRIME computers and microcomputer laboratories.
- Atomic absorption-flame emission spectrometers.
- Ion and gas chromatographs.
- Electron microscopes.
- Mass and magnetic resonance spectrometers.

Career Opportunities

Geology
Energy Exploration
Resource Exploration
(Mining, Petroleum, etc.)
Water Resources
Land Use Planning
Environmental Assessment
Science Teaching
Engineering Geology
Environmental Health
Geophysics
Well Logging
Mining Engineering

Faculty

Jon C. Avent, *Chair*

Arthur H. Barabas
Bruce A. Blackerby
Roland H. Brady
Eugene G. Cserna
Frederika J. M. Harmsen
Seymour Mack
Robert D. Merrill

Undergraduate Advisers: All full-time faculty
Graduate Adviser: Robert D. Merrill

Undergraduate Program

Geology Major. The bachelor's degree with a major in geology consists of a total of 130 units including 45–46 units of geology. For general degree requirements see *Degree Requirements*. A student planning graduate study is advised to meet the foreign language requirements of the institution he plans to attend.

High School Preparation. Adequate high school preparation for a major in geology will facilitate the progress of the student through our program. This preparation should include: algebra (2 years), plane and solid geometry, trigonometry, chemistry, and physics or biology. Also recommended is English (4 years).

Bachelor of Science Degree Requirements

	Units
1. Major requirements	45–46
a) Lower-division requirements: Geol 1 or 15, 12 and 13 concurrently, 30	(11–12)
b) Upper-division requirements: Geol 100, 101, 102, 104, 106, 107, 108A–B Two of the following: Geol 105, 110, 122	(28)
c) Upper-division Geology electives (See Note 2)	(6)
2. Additional requirements: Chem 1A–B; Math 75, 76, or 71, 72, 76; Math 77 or 101 or C Sci 20 or 40; Phys 2A–B	29–32
3. Remaining General Education requirements	45*
4. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a minor	7–11
Total	130

* Of the 51 required General Education units, 6 are satisfied by Chem 1A–B (Division 1) and Math 75 (CORE) if intermediate algebra was completed in high school (see *General Education*). Consult the geology department or your faculty adviser for details.

Notes:

1. "Additional requirements" courses may be applied to satisfy requirements of General Education, or a minor, as appropriate. They also may be taken *CR/NC* (see *Credit/No Credit Grading*).
2. No more than 1 unit of Geol 160 may be used to fulfill the upper-division elective requirement. Geol 151 and 168 are not applicable toward geology major requirements.
3. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy geology major requirements.
4. *CR/NC* is not permitted in the geology major with the exception of Geol 30, 160 and 189L.
5. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.

Geology Minor

A minor in geology consists of 20 units of approved coursework and must include 6 upper-division units.

Credential Program

For the Single Subject Waiver program see Physical Science section.

Graduate Program

The Department of Geology offers graduate courses of instruction and research leading to the Master of Science degree. The graduate courses at CSU, Fresno are designed to meet the needs of individuals with several different career objectives: (1) to provide the first postbaccalaureate degree for students preparing for eventual enrollment in doctoral programs in geology and related sciences, (2) to prepare students for industrial or government employment, or (3) to extend the competence of secondary school and junior college teachers in the earth sciences.

Master of Science Degree Requirements

The graduate program for the Master of Science degree in Geology is based on the equivalent of the undergraduate major at CSU, Fresno. Twenty of the 30 units required for the degree must be in geology. By the end of the first semester each new student should have taken the Graduate Record Examination Advanced Test in Geology. For specific requirements consult the chair of the department; for general requirements see Division of Graduate Studies and Research.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements, Foreign Language Requirements* and *Criteria For Thesis and Project.*)

Under the direction of a graduate adviser each student prepares and submits a program individually designed within the following framework:

Courses in geology, including at least 15 units in 200-series.

	Units
(See *specific requirements*)	20
Approved upper-division or graduate course electives in geology or related fields such as biology, chemistry, physics, engineering and mathematics. Electives determined in consultation with graduate adviser	10
Approved electives in geology or related fields	0–6
Total	30

Specific requirements. Geol 299 (3–6 units). Oral presentation of thesis. Other courses may be specified after examination of the student's record and the performance on the Graduate Record Examination Advanced Test. Any graduate student of geology doing a thesis on a foreign area must have knowledge of the area's language or the language in which source materials are published.

COURSES

Geology (Geol)

1. Physical Geology (4). Processes and materials which together produce the different topographic and geologic features of the earth. Plate tectonic theory (including continental drift) as the unifying model to explain geologic phenomena. Effects of geology on man. General Education BREADTH, Division 1. (3 lecture, 2 lab hours)

1E. Physical Geology for Civil Engineers (4). Geologic processes and materials that affect design, construction and operation of engineering developments. Includes origin of rock, soil and geologic structures. Causes and effects of earthquakes, floods, volcanic eruptions, coastal processes, landslides and subsidence. (3 lecture, 2 lab hours)

2. Evolution of Life and Continents (4). Origin and evolution of the earth as revealed by the rock record and by fossil remains. Special emphasis on the evolution of life and on the physical development of North America. General Education BREADTH, Division 1. (3 lecture, 2 lab hours)

3. Geology Field Trip (1). Extended week-end field trip to areas of geologic interest including Yosemite National Park, Death Valley, or Coastal California. May be repeated. Non-majors encouraged. (Field trip fee may be required.)

12. Mineralogy (3). Geol 13 concurrent in the geology major. Prerequisite: high school chemistry. Properties, relationships, origin of minerals; determination of common minerals by chemical and other tests. May include field trips. (2 lecture, 3 lab hours)

13. Crystallography (2). Prerequisite: high school chemistry, trigonometry. Form and structure of crystals. (1 lecture, 3 lab hours)

15. The Earth and its History (5). Portion of *Man and the Natural Environment* Cluster. Physical and historical geology, including man's use of the earth and the impact of that use on the earth. Lecture, lab, and field work. General Education BREADTH, Division 1. (Field trip fee is required.)

30. Introductory Field Methods (2). Prerequisite: Geol 1 or 15, Math 5. Introduction to methods and instruments used in geologic field work. (6 lab/field hours per week. May include weekend field trips) *CR/NC* grading only.

100. Optical Mineralogy (3). Prerequisite: Geol 13. Optical properties of minerals; identification of selected minerals by optical methods. Manipulation and use of petrographic microscope. (2 lecture, 3 lab hours)

101. Igneous and Metamorphic Petrology (4). Prerequisite: Geol 100. Origin classification, textures, and structures of igneous and metamorphic rocks; examination of samples in hand specimen and thin section. Some weekend field trips. (3 lecture, 3 lab hours)

102. Sedimentary Petrology (3). Prerequisite: Geol 30, Geol 100, 101 (or concurrently). Origin, classifications, textures, and structures of sedimentary rocks; examination of samples in hand specimen and thin section. Some weekend field trips. (2 lecture, 3 lab hours)

104. Scientific Writing (1). Prerequisite: satisfactory completion of Engl 1. Organization of the scientific paper, involving concise and logical presentation of data. Topics include analyses of abstract writing, bibliographical format, and scientific styles regarding punctuation and footnotes, preparation of illustrations. (3 lab hours) (Former Geol 104W)

105. Geomorphology (3). Prerequisite: Geol 1 or 15. Land forms, climates, geologic processes and their interrelation in shaping the earth's surface today and in the geologic past. Interpretation of topographic maps and aerial photographs. May include field trips. (2 lecture, 3 lab hours)

106. Structural Geology (3). Prerequisite: upper-division writing skills requirement must be satisfied; Geol 30, Phys 2A. Phys 2A may be taken concurrently. Recognition, representation, and interpretation of structural features of the earth's crust. Includes consideration of theoretical and mechanical principles involved in deformation of solid bodies. Study of regional tectonics and major structural provinces. Includes field trips. (2 lecture, 3 lab hours)

107. Advanced Field Methods (3). Prerequisite: Geol 30, 101, 102, 104, 106. Field trips to areas of diverse geology; observation, description and mapping of geologic phenomena (9 lab hours usually including field work on weekends or during January intersession and Spring Vacation. Includes written reports of areas selected for study. Students should contact the department for details. (Field trip fee may be required.)

108A. Field Geology (4). Prerequisite: concurrent enrollment in Geol 108B, Geol 107. Geologic reconnaissance and mapping in field groups. *Usually conducted in early summer.* Approved for *SP* grading. (Field trip fee may be required.)

108B. Field Geology — Reports (1). Prerequisite: concurrent enrollment in Geol 108A. Written presentation of field work conducted in Geol 108A. Approved for *SP* grading. (1 lecture hour)

110. Invertebrate Paleontology (3). Prerequisite: Geol 2 and either Zool 1 or 10. Invertebrate structures and development of prehistoric animals; introduction to stratigraphic importance of fossils. May include field trips. (2 lecture, 3 lab hours)

114. Engineering Geology (3). Prerequisite: Geol 1 or 15 and trigonometry. Introduction to techniques and theory of geotechnical investigations. Includes field and lab techniques in soil and rock mechanics, rock logging, geophysics, slope stability, engineering hydrogeology, stereo analysis, seismic engineering. Recommended for students in geology or civil engineering. Field trips required. (2 lecture hours, 3 lab hours)

115. Ore Deposits (3). Prerequisite: Geol 101, 106, college chemistry. Geology, mineralogy, distribution and occurrence of common ore minerals essential in industry; genesis and localization of metallic minerals. May include field trips. (2 lecture, 3 lab hours)

116. Petroleum Geology (3). Prerequisite: Geol 106. Theories of origin of petroleum, petroleum structures, prospecting, extraction methods, techniques used in exploration and development; selected petroleum fields. May include field trips. (2 lecture, 3 lab hours)

117. Principles of Hydrogeology (3). Prerequisite: physical geology is recommended. Study of relations between the geologic environment and the hydrologic cycle. Topics include: infiltration and runoff processes, principles of groundwater hydrology and water resource management. Field trips required. (2 lecture, 3 laboratory hours).

122. Stratigraphy (3). Prerequisite: Geol 30, 102. Stratigraphic principles and recognition of stratigraphic units. Emphasis on tectonostratigraphic concepts. (2 lecture, 3 lab hours or field hours)

124. Geochemistry (3). Prerequisite: Geol 101, one year of college chemistry. Application of chemical principles to geological processes. Chemical reactions involved in origin and alterations of rocks and minerals of the earth's crust. (2 lecture, 3 lab hours)

130T. Advanced Problems in Geology (1–3; max total 6 if no topic repeated). Prerequisite: senior standing in geology. Topics or problems in the following fields: geology of North America, field geology, micropaleontology, advanced ground water geology, sedimentation and sedimentary rocks, geochemistry, geophysics, volcanic geology and marine geology. Some topics may have labs.

140. Interpretation of Geologic and Topographic Maps (3). Prerequisite: Geol 105 or 106. Interpretation of geologic and topographic maps with respect to structure, stratigraphy, and processes. Some aerial photographs included. (2 lecture, 3 lab hours)

150T. Studies in Earth Science (1–3; repeatable with different topics). Applicable to the geology major only with prior departmental approval. Prerequisite: Geol 1. Earth science topics designed for students minoring in geology, with an interest in earth science, in teacher training, and for elementary and secondary teachers.

151. Minerals, Rocks and Fossils (3). Primarily for students who are not majoring in geology. Recognition, origin, importance, and uses of common and significant minerals, rocks and fossils. (2 lecture, 3 lab hours) Not applicable to the geology major.

160. Field Studies (1–4; repeatable in different studies). Prerequisite may be specified by instructor. Weekend or vacation field trips to geologically important and significant areas such as the Grand Canyon, Baja California, the Sierra Nevadas, Death Valley. Field trip fee may be required.

168. Geology of California (3). Prerequisite: introductory geology course strongly recommended. Emphasis on the evolution of California's diverse geologic provinces and the geologic processes that influence human development of one of the most geologically varied regions of the United States. Not applicable to the geology major. General Education CAPSTONE Cluster.

169. Environmental Geology (3). Prerequisite: Geol 1. Examination of the interaction between man and earth, with emphasis on earth features and processes that are hazardous to man. Includes field trips. (2 lecture, 3 lab hours)

171. Igneous Petrography (3). Prerequisite: Geol 100, 101. Identification, classification, and interpretation of igneous rocks, using the petrographic microscope and other techniques. May include field trips. (2 lecture, 3 lab hours)

189. Cordilleran Geologic Evolution (2). Prerequisite: Geol 106, 122. Emphasis on the Mesozoic geology of the central Cordilleran region of the western United States in terms of plate tectonic evolution. Concurrent enrollment in Geol 189L recommended.

189L. Cordilleran Geologic Evolution Lab (1). Prerequisite: Geol 189 (or concurrently). Weekend and/or vacation field trips to geologic localities in California studied in Geol 189. *CR/NC* grading only.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.*)

206. Depositional Systems (3). Prerequisite: Geol 101 and 105. Investigation of modern and ancient depositional systems. (2 lecture, 3 lab hours)

210. Geotectonics (3). Prerequisite: Geol 106. Theory and applications of continental drift, plate tectonics, and sea floor spreading to understanding continental geology. Special emphasis on geology of the Americas. Structural analysis of deformed plate margins. (2 lecture, 3 lab hours)

212. Mineral and Rock Analysis (3). Prerequisite: Geol 100, Chem 1A–B. Principles and techniques of mineral and rock analysis using universal stage, X-ray diffractometer, X-ray fluorescence analyzer, atomic absorption and flame emission spectrometers, and other techniques. (1 lecture, 6 lab hours)

215. Hydrothermal Deposits (3). Prerequisite: Geol 115. Geologic setting and genesis of hydrothermal mineral deposits of western Cordillera, especially in California, Nevada, and Arizona. Emphasis on relationships between convective geothermal systems and igneous activity, prospecting models, and geologic, geochemical, and geophysical exploration techniques. Required field trip and laboratory project. (2 lecture, 3 lab hours)

217. Hydrogeology Seminar (1). Prerequisite: Geol 117 or 124. Origin and chemical evolution of surface and ground waters. Interaction between waters and geologic materials and natural water flow patterns. Natural processes and man-induced changes, with focus on the waters of California. Readings from primary scientific literature and oral presentations by participants.

222. Carbonate Petrology (3). Prerequisite: Geol 101. Chemistry and content of carbonate rocks; introduction to organic and inorganic constituents with emphasis on diagenetic alteration. May include field trips. (2 lecture, 3 lab hours)

250T. Topics in Geology (1–3; max total 9 if no topic repeated). Prerequisite: major or minor in geology; permission of instructor. Advanced studies in such areas as hydrology, regional stratigraphy, and marine geology. Some topics may have labs.

271. Volcanology (3). Prerequisite: Geol 101. A study of volcanic activity, including classification, characteristics, products of eruptions, man's interactions with volcanoes and related phenomena. Field trips required. (1 lecture, 6 lab hours)

272. Metamorphic Petrology (3). Prerequisite: Geol 101, Chem 1A–B. Identification, classification, and interpretation of metamorphic and metasomatic rocks using the petrographic microscope and other techniques. May include field trips. (2 lecture, 3 lab hours)

290. Independent Study (1–3; max total 6). See *Academic Placement — Independent Study.* Approved for *SP* grading.

299. Thesis (2–6). Prerequisite: See *Criteria For Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

Gerontology

Interdisciplinary Gerontology Program
Glen C. Doyle, Ed.D., R.N., Director
San Ramon 2, Room 24
(209) 278-5216

Minor in Gerontology
Certificate in Gerontology



Gerontology is the study of aging. The Interdisciplinary Gerontology Program is designed to offer a Minor in Gerontology, a Certificate in Gerontology, individual courses on aging and the Summer Institute on Aging. Various aspects of aging are presented through courses offered by many different departments.

Advisory Council and Program Faculty

The following individuals are involved in gerontology and serve either as faculty or Advisory Council members: Lynda Brown (Health Science), Sanford Brown (Health and Social Work), Carl Carmichael (Speech Communication), Benjamin Cuellar (Social Work Education), William Fasse (Family Studies), John Franz (Employee Assistance Program), Gwen Hanson (Recreation Administration), Mark Keppler (Management), Judith Keough (Nursing), Philip Kimble (Psychology), Joanne Laslovich (Physical Therapy), Rose Lyon (Physical Education), David Natharius (Speech Communication), Elizabeth Nelson (Sociology), Ron Parker (Communicative Disorders), Patricia Pickford (Social Work Education), James Snider (Advanced Studies), and Barbara Woods (Social Work Education).

Career Opportunities

The emergence of employment opportunities and employment settings in the field of gerontology has developed as a response to the needs of a steadily increasing older population. An expanding variety and number of occupational roles are available. These include but are not limited to: state and area agency components of the national aging network, senior citizen centers, adult day care centers, skilled nursing facilities, intermediate care facilities, special programs based in acute care hospitals, Veterans Administration medical centers, senior housing sites, retirement communities, retirement programs, home health agencies, hospices, legislative bodies and community planning agencies.

There is an increased recognition of the importance of designing and providing specialized programs in the private sector. Knowledgeable people work as consultants in: banks, travel agencies, large corporations, insurance companies, educational agencies, publishing and broadcasting agencies, and department stores. The field is wide open for creative and innovative individuals.

Gerontology Minor

The interdisciplinary minor in gerontology (study of aging) is open to students in any major. It is especially designed to serve undergraduate majors in Business, Communicative Disorders, Home Economics, Health Sciences, Nursing, Physical Therapy, Psychology, Recreation, Social Welfare and Sociology; graduate majors in various social science and health professions areas; those currently working for service agencies for the aging; and aging individuals who are interested in gaining greater insight into this period of their lives.

The minor consists of from 21 to 24 semester units of credit. The total is to be determined by the student's major adviser and the director of the Interdisciplinary Gerontology Program. The following list indicates the course requirements of the minor:

		Units
A. **Basic course** (required)		3
IntD 160	Orientation to Gerontology	(3)
B. **Core courses** (four of the following courses are required)		12
IntD 132	Aging as a Social Issue	(3)
Geron 103	Maturity and Old Age	(3)
Geron 115	Health Issues of Aging	(3)
Geron 117	Resource Management of Aging	(3)
Geron 125	Social Services for the Aging	(3)
Geron 148	Biophysical Aspects of Aging	(3)
Geron 166	Social Gerontology	(3)
C. **Elective course** (any of the following courses required — or a course not completed in group B)		3
Anth 155	Folk Medicine	(3)
C D 80	Principles of Communicative Disorders	(3)
Rec 159	Volunteer Coordination	(3)
W S 10	Introduction to Changing Women	(3)
FScN 48	Nutrition in the Life Cycle	(3)
Geron 180T	Summer Institute on Aging	(2)
Nurs 180T	Intervention Strategies for Care of Older Adults	(2–3)
A S 280T	Counseling the Older Adult*	(3)
R C 211	Medical Aspects of Disability*	(3)
R C 212	Psychological and Social Aspects of Disability*	(3)
Geron 190	Independent Study	(1–3)

* Permission of instructor

In addition, classes on aging offered through the Division of Extended Education and the Saturday classes may be accepted for meeting elective credit requirements.

D. **Intern (Geron 185) or research course.** Required field work or a research project relating to the aging, usually to be arranged through the coordinator of gerontology minor. The number of units required is determined by the department concerned. Consideration is given to previous work experience with the aging 3–6

21–24

The basic and core courses in the minor can be beneficial to any student in understanding the aging process and in correcting misconceptions about characteristics of aged individuals.

Certificate in Gerontology

The certificate in gerontology is an interdisciplinary program of study awarded to students who complete 12 units of carefully selected courses in the field of gerontology. Normally the students admitted to the program have had some college preparation (e.g., an A.A. or A.S. degree, two years of college) or two years of experience related to the field of aging. Certificate work must be completed with a *C* average or better in the required 3 units and the 9 units of electives. The following list includes the course requirements of the certificate:

		Units
Required		3
IntD 160	Orientation to Gerontology	(3)
Electives		9
IntD 132	Aging as a Social Issue	(3)
Geron 103	Maturity and Old Age	(3)
Geron 115	Health Issues of Aging	(3)
Geron 117	Resource Management of Aging	(3)
Geron 125	Social Services for the Aging	(3)
Geron 148	Biophysical Aspects of Aging	(3)
Geron 166	Social Gerontology	(3)
Geron 180T	Summer Institute on Aging	(2)
Spch 188T	Communication and Aging	(3)
Nurs 180T	Intervention Strategies for Care of Older Adults	(2–3)
A S 280T	Counseling the Older Adult*	(3)
Total		12

* Permission of instructor

For further information, please call or write Glen C. Doyle, director, Interdisciplinary Gerontology Program, School of Health and Social Work, 278-5216.

COURSES

Gerontology (Geron)

103. Maturity and Old Age (3). (See Psych 103.)

115. Health Issues of Aging (3). (See H S 115.)

117. Resource Management of Aging (3). (See CSH 117.)

125. Social Services for the Aging (3). (See S Wrk 125.)

148. Biophysical Aspects of Aging (3). (See P E 148.)

166. Social Gerontology (3). (See Soc 166.)

180T. Topics in Gerontology (1–3; max total 9). Various topics in the field of aging. Content varies from semester to semester.

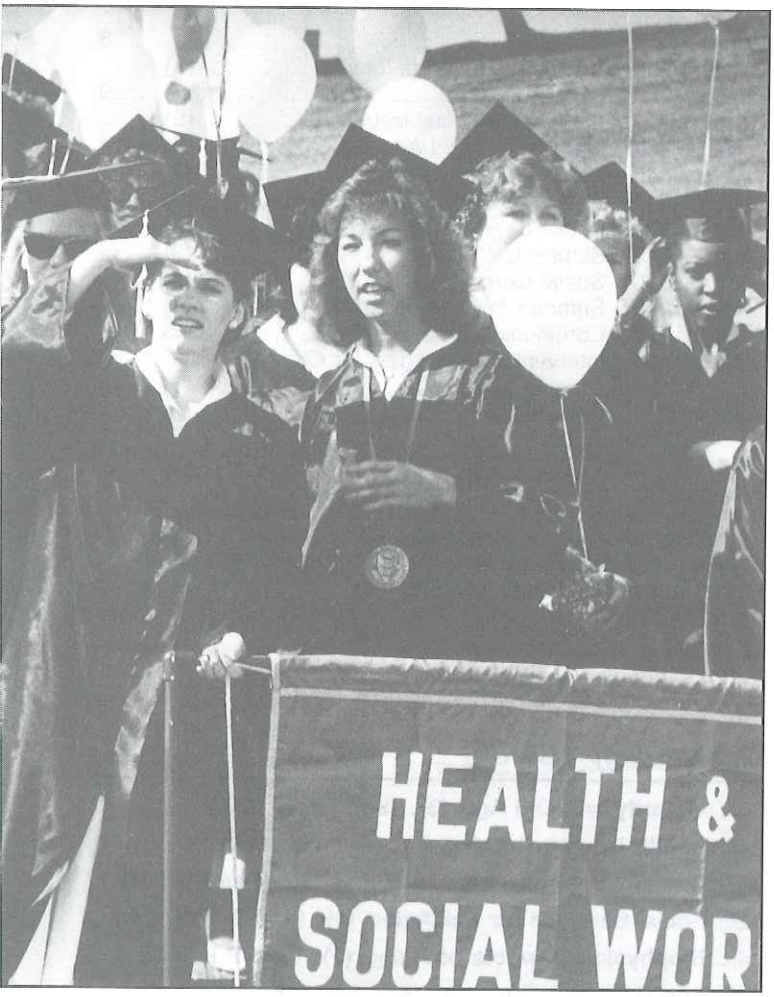
185. Internship in Gerontology (1–6; max total 6). Prerequisite: upper division or graduate standing and permission of instructor. Supervised work experience in gerontology. May be coordinated with student's major *(example: business and gerontology)*. *CR/NC* grading only.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

HEALTH AND SOCIAL WORK
Interdisciplinary Courses

School of Health and Social Work
Richard D. Ford, Dean
McLane Hall, Room 191
(209) 278-4004

Certificate in Alcohol/Drug Studies



The School of Health and Social Work offers the following interdisciplinary courses as general electives open to all students. These courses provide students with an opportunity to interact with various university disciplines that have a common purpose and with professionals who are working cooperatively in an interdisciplinary setting.

Certificate in Alcohol/Drug Studies

A certificate of special study will be awarded to those students who successfully complete a minimum of 12 units of interdisciplinary academic coursework in the area of alcohol and drug abuse. Students seeking the certificate must (1) have completed two years of college or two years of experience related to the field of alcohol/drug abuse, and (2) be regularly enrolled in the university. All coursework must be completed with a grade of *C* or better in each of the 9 required units and the 3 units of electives. The following list includes the course requirements for the certificate:

		Units
Requirements		9
H S 110	Habit Forming Substances	(3)
H S 111	Alcohol and Alcoholism	(3)
S Wrk 129	Treatment of Chemical Dependency	(3)
Elective(s)		3
Crim 141	Alcohol, Drugs and Criminality	(3)
S Wrk 122T	Counseling the Family of The Alcohol/Drug Abuser	(3)
W S 150T	Women, Children and Alcohol	(1)
W S 150T	Women and Alcohol	(1)
Crim 190 H S 190 S Wrk 190 or W S 190	Independent Study on selected aspects of alcohol/drug abuse	(1)

For further information you may contact the Department of Social Work Education at (209) 278-3992.

COURSES

Interdisciplinary Health and Social Work (HSW)

100T. Selected Topics in the Health Professions (1–3). Interdisciplinary topics of current interest covering subject matter that is appropriate for all health professional disciplines. Topics are rotated each semester. Field assignments may be required.

101. Adjustment to Disability (3). An investigation of the psychological/social adjustment process to illness and disability and methods to facilitate the development of coping mechanisms.

Health Science

School of Health and Social Work
Department of Health Science
Ronald C. Schultz, Chair
McLane Hall, Room 196
(209) 278-4014

B.S. in Health Science
Options:
Community Health
Environmental Health Science
Health Services
Occupational Safety and Health
Single Subject Teaching Credential
Minor in Health Science
M.S. in Health Science
Options:
Environmental Health Science
Health Education
Health Services Administration

The Bachelor of Science and Master of Science degrees are designed to prepare students for careers with official and voluntary health agencies at the federal, state or local levels of government as well as the private sector.

Bachelor of Science Degree

The Department of Health Science offers curricula leading to a bachelor of science degree, including a major and minor in health science with options in community health, environmental health science, health services, and occupational safety and health.

Today there is an increasing emphasis upon health, health problems and the resolution of these problems by all levels of government and by the industrial and military segments of our society. People are concerned about their health, and a concerned nation is in need of educated, trained and sensitive individuals to provide assistance and action — actions that cater to the physical, psychological and social needs of our country and developing nations throughout the world.

Career Opportunities

The options are designed to provide basic education for careers in environmental health, community health, occupational safety, public health, occupational health and the allied health professions. Individuals may be employed by voluntary health agencies, hospitals, public health agencies, and in the private sector including industry and insurance companies. Career titles and specializations include: environmental control officer, risk control specialist, health industry sales, hazardous materials management, loss control specialist, health educator, safety and health specialist, health care administration, safety officer/manager, registered environmental health specialist, secondary teaching, university teaching, safety products sales, substance abuse, industrial hygienist, health promotion, environmental analyst and disease control officer.

Master of Science Degree

The primary goal of the Health Science master's program is to provide graduate education to students and the working professionals who want advanced knowledge and skills beyond that of the baccalaureate degree. Coursework for the Health Science master's degree is varied and designed to provide the maximum opportunity for problem-solving approaches to the complex issues in the operation, environment and human factors confronting the health care systems.

Single Subject Teaching Credential

The Single Subject Teaching Credential in Health Science prepares students to teach health in the secondary schools.



Faculty

Ronald C. Schultz, *Chair*

Sanford M. Brown
Wayne N. Clark
Terri A. Hamilton
John G. Hardgrave
Nathan E. Liskey
Donald L. Matlosz
Jeannine M. S. Raymond
Sherman K. Sowby
Christopher J. Tennant
David F. Utterback

Community Health Advisers: Catherine Freeman, Terri A. Hamilton, John G. Hardgrave, Nathan E. Liskey, Sherman K. Sowby
Environmental Health Advisers: Sanford M. Brown, Wayne N. Clark, Ronald C. Schultz, Christopher J. Tennant, David F. Utterback
Health Services Adviser: Peggy J. Gish
Occupational Safety and Health Adviser: Michael J. Waite

Bachelor of Science Degree Requirements

Health Science Major

The Health Science Bachelor of Science curriculum consists of a core of five courses providing a foundation of knowledge and skills critical to the theory and practice of the health professional. In addition, students complete a specialized cluster of courses in an option that provides the depth and breadth for the area. A variety of combinations between and within options is possible to meet professional goals. Some students choose to specialize in two or more areas of community health whereas others may meet the requirements for environmental health and supplement this with occupational safety and health coursework. Still others may complete all requirements for two options such as environmental health and occupational safety and health.

A major in health science consists of a minimum of 39 units. To complete the major for the B.S. degree, students must complete the health science core (15), one of the options outlined below (24), and any additional requirements in related fields as specified. Students are encouraged to complete the additional requirements prior to the major courses as they may meet General Education requirements, and they provide a foundation for the courses in Health Science.

The General Education requirement, special course requirements, and electives, which may include a minor, complete the 82–85 units, totaling at least 124 units required for the B.S. degree. Consult the department adviser for recommended sequence of major and General Education courses.

Health Science majors may not apply credit/no credit grading toward major requirements for a baccalaureate degree. All substitutions must be approved by the department chair.

Classes offered in the Health Science Department may require field assignments.

Health Science Core (15 units)
H S 92, 100, 109, 161, 163

Elect One Option Below (24 units):

Community Health

Due to the increasing number of opportunities in the area of health, we have structured courses in personal, community, environmental and international health to complement basic courses in safety, first aid, disease, drugs and human sexuality. The curriculum is designed to prepare individuals not only to be competent instructors in the health areas, but to be health educators in many segments of our society.

Industry, business, labor and the military all seek knowledgeable individuals to plan and direct health delivery and information services. Advanced study in health systems and evaluation techniques of health systems is available to qualified undergraduate and graduate students.

Community Health Option Requirements (24 units)*
H S 104, 110, 124, 131, 133, 135

Elect 6 units from: H S 48, 105, 111, 112, 115, 117, 126, 129, 130, 152T, 182; FScN 53, 54

Additional requirements (18 units)
H S 90, Biol 10 or 105, Chem 3A, 3B, Phy 33

Environmental Health Science

The environmental health science option prepares an individual for registration as an Environmental Health Specialist. They are employed in environmental health programs for private industry or federal, state and local levels of government.

The basic goals of this program are to prepare professionals to enter the field of environmental health and to provide environmental health education to all students regardless of their major.

The environmentalists may work in research development activities, in teaching or in the implementation of environmental health concepts in the surveillance, prevention and control of environmental hazards. The program is accredited by the National Environmental Health Association and approved by the State Department of Health Services.

Environmental Health Science Option Requirements (24 units)* H S 105, 160, 162, 165, 167, 168, 6 units approved electives.

Additional requirements (20 units)
H S 90, Biol 10, 105, Chem 3A, 3B, Micro 20

Registration as an Environmental Health Specialist: Students who desire to take the State Examination for Registration as an Environmental Health Specialist must complete H S 175 and must include among their electives and General Education selections the following courses: Chem 8, Math 70 and Phys 2A–B. Consult the departmental adviser concerning substitutions and additions. (Approved by the State of California Department of Health Services and accredited by the National Environmental Health Association.)

Health Services

The Health Services option provides a broad based program to prepare the student for generalist administrative positions within the health care system. The curriculum is designed with an emphasis on exposing the student to the principles of health services administration and the application of these principles. For additional information see the departmental adviser.

* H S 92 may also be applied to satisfy the General Education CORE mathematics requirement if intermediate algebra was completed in high school.

Health Services Option Requirements (24 units)*
H S 151, Mktg 100, H S 154 or Pl Si 181 or Mgt 104, Econ 131

Elect 12 units from:
Econ 162, Mktg 132, 138, HRM 150, H S 104, 115, 129, 143, 168, 185F, Soc 147, I S 103

Additional requirements (15 units)
Econ 40-50, Acct 3, H S 90, 182

Occupational Safety and Health

The basic goals of the Occupational Safety and Health option are to provide the specialized knowledge in the physical and social sciences that allow the individual to perform the functions within the scope of the professional safety position, and to successfully provide leadership to conserve life, health and property. This option is designed to give students a thorough understanding of the great variety of problems met in the occupational safety and health field.

Occupational Safety and Health Option Requirements (24 units)* H S 48, 105, 143, 145, 147, 160, 168, 3-unit approved elective

Additional requirements (17 units)
H S 90, 185F (3 units), Phys 10, Chem 3A, 3B

Students who desire to meet the recommendations for the Safety Professional should consult with the department adviser for the selection of General Education and elective courses.

Health Science Minor

The minor in health consists of 20 units composed of the health science core requirement and 5 units from the courses required in any one option. Consult the department adviser for assistance in program planning.

Credential Program

The Single Subject Waiver program in Health Science consists of the Bachelor of Science major and additional requirements. For assistance in program planning, consult the teacher education coordinator.

Single Subject Waiver Program in Health Science Requirements
Health Science Core (15 units) H S 92, 100, 109, 161, 163

Elect one option: Community Health, Environmental Health, or Occupational Safety and Health (24 units)

In addition the following courses *must* be included in the program: H S 48, 104, 110, 124, CFS 39 or Psych 155, FScN 54, Phy 33, Spch 8 or Spch 114

Recommended courses for credential candidates: H S 112, 152T, 182, A S 174, Biol 122, P E 156B, Psych 136

The professional education program as outlined by the School of Education and Human Development (30 units) must also be completed.

Certificate in Alcohol/Drug Studies

The Department of Health Science is participating in a certificate of special study awarded to those students who successfully complete a minimum of 12 units of interdisciplinary academic coursework in the area of alcohol and drug abuse. (For complete details, see *Health and Social Work, Interdisciplinary Courses,* in this catalog.)

* H S 92 may also be applied to satisfy the General Education CORE mathematics requirement if intermediate algebra was completed in high school.

Master of Science Degree

Options have been designed to provide in-depth study in environmental health (approved by the State of California Department of Health Services), health services administration and health education.

Requirements

Admission: The M.S. program is open to students with health science or related undergraduate degrees who have demonstrated the ability to perform at an advanced level. Evidence of such ability is required by: (1) a satisfactory undergraduate grade point average (2.5 overall and 3.0 in the major or on the last 60 units); (2) a minimum Graduate Record Examination Score (Q-430 or V-450); (3) passing successfully the department examination; (4) completion of all prerequisites.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Project.*)

Under direction of a graduate adviser, each student prepares and submits a coherent program individually designed within the following framework:

	Units
Core courses in health science (see specific requirements)	18
Courses in health science option	6–12
Approved electives	0–6
Total (including 18 units in 200 series)	30

Specific Requirements: Health Science 210, 213, 222T, 280, 285F, 298 or 299.

Environmental Health Science

The curriculum is designed to prepare the individual for a lifetime career in the area of environmental health in industry and governmental agencies. This has been accomplished by providing a foundation of core courses emphasizing the administration and professional aspects of public health. The option curricula encompasses several aspects of environmental health and are designed to provide the student with in-depth and specific concepts of environmental health. Individuals have flexibility within the program and may develop a particular interest in a specific area by taking courses as electives in their area of concern. The program is approved by the State of California Department of Health Services.

Health Services Administration

The format of the program is such that an individual may continue full-time employment while pursuing the degree program. Subjects range from health planning and data analysis to organizational behavior and manpower management.

The Health Services Administration program provides:
- Preparation for administrative roles within various settings in the health services field.
- Training in technical and analytical skills required of administrators in health care systems.
- Preparation for dealing with the philosophical and ethical issues faced by administrators.
- Opportunities to interact with other health professionals.
- Experiential approaches to management problems.

Health Education

The Master of Science degree in health education provides an opportunity to diverse groups of individuals to improve competencies as public health educators and teachers of health.

The major goals of the program are to provide advanced knowledge in the area of education and to provide a leadership and communication foundation for the professional health educator.

COURSES

Health Science (H S)

48. Advanced First Aid and Emergency Care (3). American Red Cross Advanced First Aid and Emergency Care course. Safety factors, disaster preparedness and emergency treatment, including cardiopulmonary resuscitation (CPR), control of bleeding and artificial respiration. Also, emergency childbirth; water and auto extrication. Certification for meeting requirements. (2 lecture, 2 lab hours) (Former H S 113)

90. Contemporary Health Issues (3). Significance of basic health problems applicable to the young adult and to society. General Education BREADTH, Division 4.

92. Public Health Statistics (3). Prerequisite: ELM Exam; intermediate algebra. Introduction to descriptive and inferential statistics as applied to evaluation and research in allied health. Central tendency and dispersion; central limit theorem; hypothesis testing; ANOVA; correlation, non-parametric methods. Interpretations of public health statistics. General Education CORE, Quantitative Reasoning. (2 lecture, 2 lab hours) (Former H S 102)

100. Community Health (3). Prerequisite: H S 90. Public health services as they affect the community; investigation and analysis of community health problems.

104. International Health (3). Prerequisite: H S 90. History and evaluation of programs of international health organizations; health problems on a world scale.

105. Environmental Safety (3). The physical environment as it relates to accidents and safety; investigation and analysis of factors involved in the areas of home, school, industry, recreation and traffic; human factors; accidents by type, age groups and occupations.

109. Epidemiology of Disease (3). Modern concepts and principles of epidemiology; interaction of all agents, host, and environmental factors of communicable and noncommunicable diseases; problems of the aged.

110. Habit Forming Substances (3). The misuse and abuse of chemical substances by humans; includes the psychological, social and physiological effects.

111. Alcohol and Alcoholism (3). Physical, mental and social factors related to the consumption of alcoholic beverages; the development of alcohol dependence.

112. Consumer Health (3). Consumer health as it relates to selection of health care products and services; how to differentiate fact from fiction in health matters.

115. Health Issues of Aging (3). (Same as Geron 115.) Basic principles and concepts of the aging process; includes the physical, social, emotional and mental components of health. Benefits of health promotion and preventive action for the aging are also explored.

117. Holistic Health (3). Includes the discovery and integration of the individual into all levels of being: body, mind and spirit. Total approach will be investigated in terms of preventive health practices.

120. Elementary School Health Science Education (3). Designed for the multiple subjects teacher credential candidate (non-health science major) to meet current California legislative requirements. Focus upon the methods, processes and content used in the elementary schools for the teaching of health science. Student evaluation based on expected competencies.

121. Secondary School Health Science Education (2). Designed for the single subject teacher credential candidate (non-health science major) to meet current California legislative requirements. Focus upon the methods, processes and content used in the secondary schools for the teaching of health science. Student evaluations based on expected competencies.

124. Human Sexuality (3). A multi-faceted approach to the study of sexuality as a natural human function. Involves the biological, psychological, cultural and sociological components of the human experience. General Education BREADTH, Division 4.

125. Perspectives in Sexuality for Health Professions (3). Prerequisite: H S 124. Designed specifically for upper-division students in health professions. Focus on those individual sexual problems leading to the service of physical therapists, rehabilitation counselors, nurses or other helping professions.

126. Female Sexuality (3). (Same as W S 127.) Studies on female sexuality which include past and present sexual roles, female sexual response patterns and discussion of common problems encountered by women functioning as sexual beings.

129. Rural Health (3). Health problems of rural areas including community medical services, medical facilities, federal, state, and local legislation and administrative problems.

130. Women's Health (3). (Same as W S 130.) Examines current crises/controversies in women's health care. Includes conventional/alternative approaches to treatment, management and prevention with emphasis on self-care and promotion of optimum health. (Former H S 152T section)

131. Principles of Health Education (3). Study of the foundations, theories, systems and principles of health education. Includes an analysis of social, medical and environmental factors on health-related behaviors.

133. Health Education Methods (3). Theory and practice of health education. Study of concepts and practices relating to the skills and methods in community health education. (Former H S 152T section)

135. Introduction to Human Disease (3). Prerequisite: H S 90; Phys 33. Concepts and principles of disease and dysfunction of the human body. Detection, diagnosis, treatment, etiology, pathogenesis and prevention.

143. Occupational and Industrial Safety (3). Application of safety and accident prevention measures that provide a basis for insight into the hazards of occupational and industrial situations.

145. Occupational Safety Management (3). Concepts and principles dealing with the problems, methods, and solutions in the management and development of an effective safety program in the occupational environment.

147. Evaluation of the Occupational Environment I (3). General principles of investigation for chemical and physical hazards commonly encountered in the occupational environment. Sampling strategies, quantitative analysis, combustible gases, organic vapors and non-ionizing radiation. (2 lecture, 2 lab hours)

148. Evaluation of the Occupational Environment II (3). Prerequisite: H S 147. Concepts and principles of investigative analytical methods for hazards commonly encountered in the occupational environment. Ionizing radiation, noise, metals and particulates including asbestos. (2 lecture, 2 lab hours)

149. Control of the Industrial Environment (3). Prerequisite: H S 147, 168. Concepts and principles of controlling physical and chemical compounds in the industrial environment. (2 lecture, 2 lab hours)

151. Health Law and Legislation (3). The theory and practice of managing inspection-based enforcement programs in health care and environmental health areas, with emphasis on legislation, procedure and cases relating to public health. (Former H S 152T.)

152T. Topics in Health (1–3; max total 12). Analysis and investigation of selected areas in school and community health, public health, and health and safety with some topics including laboratory experiences.

154. Health Care Administration (3). Organizational design and managerial principles as they apply to the private sector of health care.

160. Principles of Toxicology (3). Basic principles and concepts of toxicology with a particular emphasis on the regulation of environmental and industrial toxicants for man.

161. Environment and Man (3). General principles of environmental health with a particular emphasis on the interaction between man and the environment. Environmental epidemiology, water, wastewater, air, solid waste, ionizing radiation and noise.

162. Environmental Health (3). Basic principles and concepts of environmental health with a particular emphasis on health hazards, communicable disease control, contamination control, food protection, rodent control, managing special environments, planned environments and environmental health organizations.

163. Public Health Administration (3). Principles of public health administration; fundamentals of organization and administration in public health.

165. Directed Group Study in Environmental Health (3). Prerequisite: H S 161, 162. Problems of environmental health studied through field trips, observations, demonstrations and seminars. (2 lecture, 2 lab hours)

166T. Topics in Environmental Health (1–3; max total 12). Analysis and investigation of selected areas in environmental health with some topics including laboratory experiences.

167. Public Health Laboratory Techniques (3). Designed to provide training in the use of laboratory procedures and techniques of adjusting and operating monitoring equipment used in water quality, air pollution, noise pollution, food sanitation, radiological health and toxic substances. (2 lecture, 2 lab hours)

168. Occupational and Industrial Health (3). Prerequisite: H S 161 or 162. Concepts of occupational health as they pertain to appraising and controlling environmental health hazards; occupational diseases, chemical, biological, and physical agents



that produce organic or systemic damage. Problems in toxicology, measurement instruments and evaluating health hazards.

170. Health Effects of Indoor Pollution (3). A descriptive analysis of environments encountered at home and in the workplace with an emphasis on assessment of risk, health effects and a review of federal regulations that apply to these environments. General Education CAPSTONE Cluster, Critical Thinking.

175. Environmental Internship (3–6; max total 6). Prerequisite: completion of 21 units of the environmental health option in the Health Science major. Provides practical experience in environmental health. The internship may be with a governmental agency or industrial situation or a combination, depending upon the student's need. *CR/NC* grading only.

182. Computers for the Health Professions (3). Introduction to the basic use and practical application of personal and mainframe computers in health-related professions. Laboratory use of computers covers word processing, SPSS, data entry, data management, principles of programming and use of online data bases. (2 lecture, 2 lab hours) (Former H S 152T section)

185F. Field Work in Health (1–3; max see below). Repeatable to 3 units in any one area, maximum total 6. Prerequisite: completion of 24 units of the health science major. Provides practical experience in a community work setting.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.*)

203. Seminar in Community Health Organization (3). Prerequisite: H S 100. Individual research, analysis and evaluation in relation to educational aspects of community health programs; group procedures; community organizations; selection, development and use of media. Field assignments are required.

205. Seminar in Safety Problems and Programs (3). Prerequisite: H S 105. Development, organization and administration of safety programs; individual research, analysis and evaluation of pertinent problems. Field assignments are required.

210. Seminar in Health Services Administration (3). Prerequisite: H S 163. Individual research, analysis and evaluation of the organization, administration and legal aspects of health programs. Field assignments are required.

213. Health Planning and Program Evaluation (3). In-depth analysis of the principles and practices in comprehensive health planning and program evaluation. Field assignments are required.

222T. Seminar in School and Community Health (1–3; max total 15). Individual research, analysis and evaluation of current topics in school health education and community health education programs such as family life education, consumer health problems, substance abuse and chronic disease. Field assignments may be required.

223. Seminar in Health Science Education (3). Prerequisite: teaching experience. Individual research, critical analysis and evaluation of the health science program; curriculum materials, and special techniques relating to instruction, services and environment. Field assignments are required.

242T. Seminar in Occupational Safety and Health (1–3; max total 15). Prerequisite: H S 105 and 143. Individual research, analysis and evaluation of current topics such as loss control, product safety laws and governmental occupational standards. Field assignments may be required.

262T. Seminar in Environmental Health (1–3; max total 15). Individual research, analysis and evaluation of current topics: air, water, housing, vector control and other selected environmental health problems. Field assignments may be required.

280. Seminar in Techniques of Health Research (3). Research methodology, identification of health research problems, use of library resources, data gathering and processing; writing a research report.

285F. Field Work in Health (1–4; max total 10). Planning, implementation, participation, evaluation in selected areas: safety, school health, community health, physical handicaps, occupational health and environmental health. Approved for *SP* grading.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

298. Project (2–4; max total 4). Prerequisite: advancement to candidacy for M.S. degree in health science. See *Criteria for Thesis and Project.* A significant endeavor in health science that may include an educational booklet, audio-visual presentation, evaluation of a health agency, or the development of an experimental device or piece of equipment. A narrative component is required which will follow a formal format and shall include a written abstract. Approved for *SP* grading.

299. Thesis (2–4; max total 4). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

302. Selected Topics in Health (1–3; repeatable with different topics). Topics in community health, environmental health, health services, and occupational safety and health for teachers, health professionals and others.

History

School of Social Sciences
Department of History
John C. Kendall, Chair
Social Science Building, Room 101
(209) 278-2153

B.A. in History
Minor in History
M.A. in History
Single Subject Teaching Credential in Social Science

History is the study of man's recorded past. It encompasses all aspects of human behavior, social organization and cultural development. The arts and the sciences, the development of technology and changing economic forces are as much a part of history as is politics or social conflict.

The student of history is engaged in a journey through time in which he or she can witness and compare the development of a variety of cultures and the interrelations between people in many different circumstances. Through the study of past events, history provides a great storehouse of experience by which the theories of the other social sciences can be tested. And through its analysis of the development of institutions and cultures, it provides one of our best tools for understanding social phenomena.

History is also one of the broadest and most universal of the humanities. Just as the personality of any individual is shaped through the totality of his past experiences, so cultures and institutions also develop in time. The study of history can help students understand themselves and their culture better and develop a more tolerant and humane spirit toward others. In this way, as in so many others, a knowledge of the past can help all of us meet the problems of today with greater understanding and compassion.

Faculty and Program

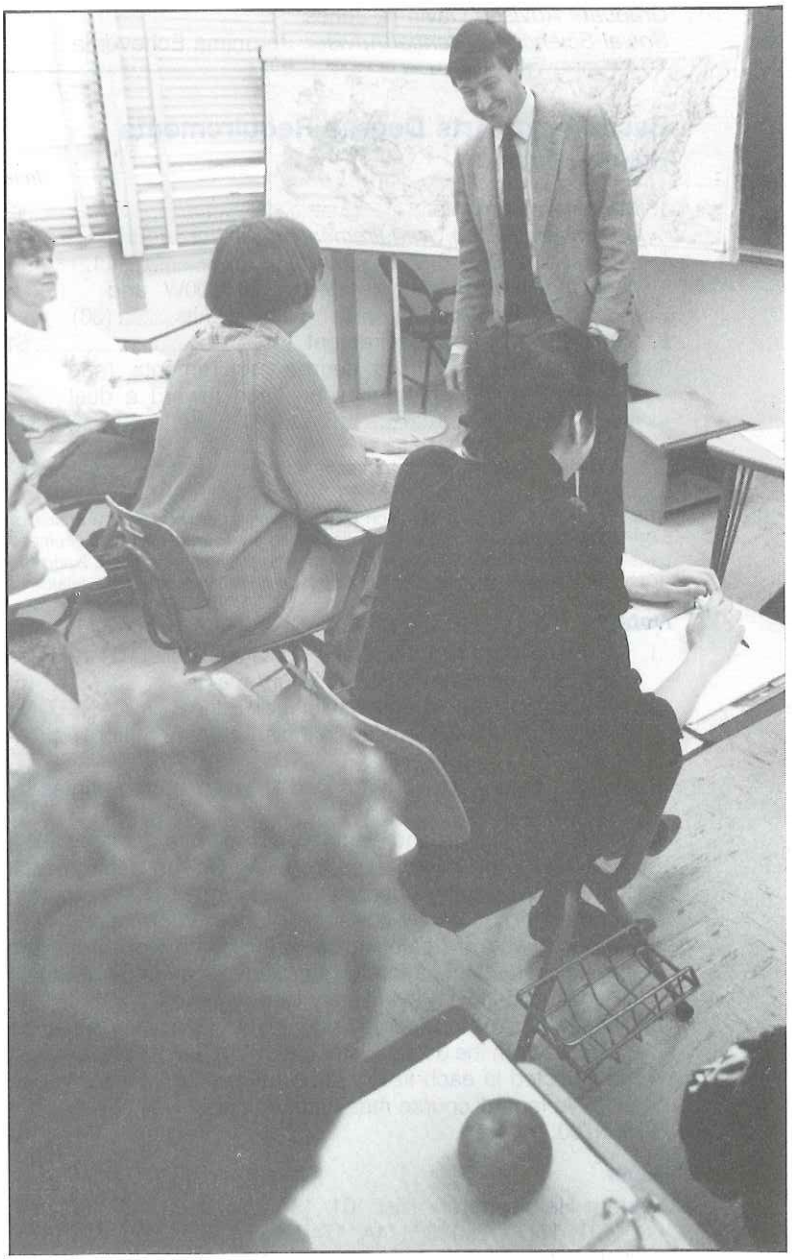
The Department of History at CSU, Fresno has 18 faculty members offering a wide variety of courses in the history of Europe, the United States, Latin America, the British Empire, Africa, the Middle East and the Far East, as well as courses in intellectual and cultural history, social history, military history, and the history of women.

The history department offers a major and minor in history for the Bachelor of Arts degree, a graduate program leading to the Master of Arts, and courses for use in the teaching credential program. It participates in the non-departmental social science major and in the interdisciplinary programs and minors in Armenian studies, Asian studies, classical studies, Latin American studies, Russian area studies, and women's studies. History courses may also be used as electives toward graduation in most other majors, and the history department encourages students to take minors and second majors in other fields as well.

Career Opportunities

A history major is trained to read with comprehension and to compare and analyze both written and oral material. In addition he or she must know how to evaluate evidence and sources, how to critique the writing of others, and how to do research and writing on his or her own. These are highly valued skills in many occupations and professions today, and the history department offers preparation for careers in teaching, law, government service, librarianship, journalism, publishing, and business. Career opportunities may also be found in such diverse fields as marketing, advertising, insurance, public relations, social services, urban planning, and the foreign service.

Students with questions related to their future careers are encouraged to consult with the faculty advisers of the history department, as well as with the Office of Advising Services and the Office of Career Planning and Placement Services, which can provide much useful information with regard to career planning and current job market trends.



Faculty

John C. Kendall, *Chair*

Stephen A. Benko
D. Loy Bilderback
Roger C. Bjerk
John W. Bohnstedt
James M. Brouwer
Sidney H. H. Chang
Carlos A. Contreras
Robert J. Dinkin
Jeronima Echeverria
Warren E. Gade
H. Marshall Goodwin, Jr.
David C. Hudson
David N. Jones
W. Hudson Kensel
Peter J. Klassen
Robert M. Smetherman
Ephraim K. Smith, Jr.

Undergraduate Adviser: John C. Kendall
Graduate Adviser: David N. Jones
Social Science Credential Adviser: Jeronima Echeverria

Bachelor of Arts Degree Requirements

History Major

	Units
1. Major requirements	42
a) Lower-division requirements (select four): Hist 1, 2, 3, 5, 6, 7	(12)
b) Upper-division requirements: Hist 100W and 27 additional History upper division units	(30)
2. General Education requirement	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a dual major or minor	31–37*
Total	124

* This figure takes into consideration that a maximum of two General Education BREADTH courses may also be applied to satisfy History major requirements (see *General Education*). These courses may be selected from Hist 1, 2 and 101. Consult the history department chair or faculty adviser for additional details.

Notes:

1. No more than two General Education BREADTH courses may be counted toward the History major.
2. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy History major requirements.
3. History majors are not permitted to take history courses by *CR/NC* grading.
4. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
5. Students who are planning to do graduate work in history are advised to take a foreign language as an undergraduate in consultation with the History Department.
6. The 27 units of upper-division history electives must be selected from the 3 fields listed below. At least 1 course must be selected in each field, but no more than 18 units in one field. At least 1 course must deal primarily with history prior to 1700.

Fields

Western Hemisphere: Hist 101, 137, 153, 160, 161, 162, 165, 166, 169T, 171, 172, 173, 174A, 174B, 177, 178, 179T, 180, 181A, 181B, 183, 184A, 184B, 186, 188, 189, 190, 198.

European: Hist 103A, 103B, 111, 112, 116, 119T, 120, 121, 122, 124T, 125, 126, 129T, 130, 131, 132, 133, 134, 135, 136, 138, 140, 141, 142, 143, 144, 145, 147, 148, 149T, 150, 151, 190, 198.

Asian, African, and Middle Eastern: Hist 107, 108A, 108B, 109T, 110, 114, 115, 157, 190, 191A, 191B, 198, 199T.

History Minor

The History minor consists of 18 units of upper-division history courses, which should be chosen in conjunction with an adviser in the history department. History minors are not permitted to take history courses by *CR/NC* grading.

Credential Program

See *Social Science Major* for the Single Subject Waiver program in social science.

The American History Requirement

The American history requirement for graduation may be fulfilled by passing (a) the Advanced Placement Examination (See *Advanced Placement*) or (b) Hist 11 or 12.

Graduate Program

The Master of Arts degree program in History is designed to extend the competence of persons engaged in a wide variety of fields requiring a broad grasp of historical knowledge, techniques, and interpretation, for those in public service, for teachers at various levels, and for those anticipating advanced graduate study in history.

Prerequisites: Admission to the Master of Arts degree program in History assumes undergraduate preparation equivalent to a CSU, Fresno major in history. Majors from other disciplines may qualify for admission depending on grade point average and other factors deemed pertinent for success in historical studies. The department determines in each case whether the applicant needs additional preparation, before receiving classified standing.

Master of Arts Degree Requirements

(See *Graduate Studies and Research.*)

The history department offers a 30-unit Master of Arts program with two options: *Thesis* and *Examination.* The basic requirements for both are:

A. Core: 12 units, consisting of History 200 (3 units), History 210 or 220 (3 units), History 230 or 240 (3 units), History 280T (3 units).

B. Six units from among 100-level History courses and/or History 210, 220, 230, and 240 (except History 100W, 190, 198). With the approval of the departmental adviser, up to 6 units of related courses in other departments may be substituted.

C. Six units from among History 280T (if repeated), History 290, History 292.

Thesis Option: Six units of History 299A–B.

Examination Option: Six additional units from Category *B,* plus a written comprehensive examination in three fields chosen from among the following. No more than two may be taken from any one group.

Group I: a) Ancient History b) Medieval History c) Early Modern Europe to 1815 d) Modern Europe since 1815.

Group II: a) The United States to 1865 b) The United States since 1865.

Group III: a) Latin America b) Asia and Africa.

Comprehensive examinations are given during the first week in November and the first week in April of each year. For other specifics, consult the department graduate adviser; for general requirements see the *Division of Graduate Studies and Research*.

Foreign Language Requirement. This is an optional requirement determined at the discretion of the Department of History and is contingent upon the research needs of the individual. Candidates writing a thesis based on foreign language sources will be expected to pass a language competency examination to be administered by the Department of History. Language examinations will be given during the first week in November and the first week in April of each year. For details, see the departmental graduate adviser.

COURSES

History (Hist)

1. Western Civilization I (3). The Mediterranean and European world from prehistoric to early modern times. Social, political, intellectual, and artistic movements in the ancient Fertile Crescent, classical Greece and Rome, and in Medieval, Renaissance and Reformation Europe. General Education BREADTH, Division 6. (CAN HIST 2)

2. Western Civilization II (3). Survey of modern European culture since the 17th century. Impact of industrialization and urbanization; political revolutions and ideologies; intellectual, artistic and religious movements; European imperialism; the two world wars and changing patterns in contemporary European life. General Education BREADTH, Division 6. (CAN HIST 4)

3. Colonial America (3). Western Hemisphere history from discovery to independence.

5. The World Today (3). A consideration of selected current affairs in their historical perspectives. Topics change with each offering of the course.

6. East Asian Civilization (3). Introduction to the history and cultures of the East Asian countries, particularly China, Japan, and Korea. Examination of the East Asian mind as reflected in Confucianism, Taoism, Buddhism and in resistance to the challenges of the West.

7. African Civilization (3). Not open to students with credit in Hist 157 prior to fall, 1983. Survey of African history from ancient times to the present. Emphasis is on political, economic, and religious movements which have contributed to the rich diversity and the distinctive unity of African civilization.

11. American History to 1865 (3). Meets the American history requirement. The formation of the Union and the development of American society to 1865. General Education CORE. (CAN HIST 8)

12. American History from 1865 (3). Meets the American history requirement. The development of American society since 1865. General Education CORE. (CAN HIST 10)

100W. Introduction to Historical Method (3). Prerequisite: Engl 1, upper-division standing. (Consult department for more specific requirements of individual instructors.) Introduction to the theory and practice of historical inquiry. Students receive careful guidance and criticism in preparing papers on historical subjects. Emphasis is placed on research techniques, evaluation of evidence, documentation, bibliography, organization, style and mechanics of writing. Meets the upper-division writing skills requirement for graduation.

101. Women in History (3). (Same as W S 101.) Historical survey of women's roles in history, with an emphasis on the emergence of the feminist movement. General Education BREADTH, Division 9.

103A. History of Early Christianity (3). Early Christianity from the first century to Constantine the Great and the legalization of Christianity (313 A.D.); origin of Christian movement from Judaic roots and its spread in the Graeco-Roman world; development during the early patristic period. General Education CAPSTONE Cluster.

103B. History of Medieval Christianity (3). Medieval Christianity from its legalization to eve of Reformation. Christian institutions and ideas, their impact upon society; reform movements and decline of Christian influence; gradual secularization of society.

107. Modern Middle East (3). Survey of Middle Eastern history since Muhammad, with emphasis upon the 19th and 20th centuries. The Middle East under European imperial domination; nationalist movements and revolutions; the Arab-Israeli conflict; the Middle East in contemporary world politics. (Former Hist 109T section)

108A. Armenian History I: Ancient and Medieval (3). Not open to students with credit in Hist 108 prior to fall 1981. History of Armenia and Armenians from prehistoric times to the 13th century Mongol invasions will be considered from Armenia's point of view as well as from that of its neighbors: Assyria, Iran, Rome, Byzantium, the Arabs, and the Seljuk Turks.

108B. Armenian History II: Modern and Contemporary (3). Not open to students with credit in Hist 108 prior to fall 1981. Discussion of the Armenian Kingdom of Cilicia, the rise of the Ottoman Empire, Armenia's subjugation to Turkish, Persian, and Russian Empires, the "Armenian Question," the massacres and Genocide, Soviet Armenia, and diasporic communities in America, Europe, and the Near East.

109T. Studies in Middle East and Africa (1–3; max total 6 if no topic repeated). Intensive study of special topics.

110. Ancient Near East (3). Ancient civilizations of the Middle East. History and culture of the Sumerians, Assyrians, Babylonians, and Persians from the dawn of history to Alexander the Great and the ascendance of Greece.

111. Ancient Greece (3). The history and culture of ancient Greece from the Minoan-Mycenaean periods through the Golden Age of Athens to the dissolution of the empire of Alexander the Great. General Education CAPSTONE Cluster.

112. Ancient Rome (3). The early history of Rome and the evolution of Roman society, politics, and culture through the republican and imperial periods. General Education CAPSTONE Cluster.

114. Ancient Egypt (3). The history and culture of Egypt from prehistoric times to the death of Cleopatra. In addition Phoenicia and Carthage are briefly discussed.

115. Ancient Israel (3). Ancient Israel from Abraham to the destruction of Jerusalem in 70 A.D. Jewish religious thought is discussed by placing the books of the Old Testament in their historical context. General Education CAPSTONE Cluster.

116. Greek and Roman Religion (3). Survey of the religious ideas, customs and practices of ancient Greeks and Romans from the time of Homer to the establishment of Christianity. General Education CAPSTONE Cluster.

119T. Studies in Ancient History (1–3; max total 6 if no topic repeated). Intensive study of special topics.

120. Later Eastern Roman or Byzantine Civilization (3). The Roman Empire in the East from the anarchy of the third century to the fall of Constantinople; political, military, and economic causes of its survival, the Church's role, and the Empire's relations with the Islamic, Latin, and Slavic world.

121. The Middle Ages (3). Medieval Europe from the fall of the Roman Empire in the West to the Renaissance.

122. Medieval Culture (3). Selected aspects of medieval life and culture such as warfare, commerce, art and architecture, learning and the university presented as manifestations of the medieval mind. Extensive use of visual materials.

124T. Studies in Medieval History (1–3; max total 6 if no topic repeated). Intensive study of special topics.

125. Renaissance (3). Social, intellectual, political and economic factors that shaped Europe in the 14th and 15th centuries; humanism, foundations of the state; secularization and dissent within the church. General Education CAPSTONE Cluster.

126. Reformation (3). Analysis of the political, social, and intellectual movements associated with the 16th century religious upheaval.

129T. Studies in Intellectual and Social History (1–3; max total 6 if no topic repeated). Topics concerned with ideas and movements that have significantly shaped the course of history.

130. Europe in the 17th Century (3). European culture, society, and politics from 1600 to the death of Louis XIV.

131. Europe in the 18th Century (3). Intellectual, social and political development of Europe from 1715 to the French Revolution and Napoleon Bonaparte.

132. Europe in the 19th Century (3). Prerequisite: Hist 2 or equivalent. History of Europe (mainly Great Britain, France, Germany and Austria) from Napoleon to the outbreak of World War I. Social and cultural consequences of the Industrial Revolution; rise of modern national states; European imperialism and dominance in world affairs.

133. Europe in the 20th Century (3). Narrative and interpretive account of 20th century Europe. Stress on the impact of World War I, the Communist and Fascist Revolutions, the economic recovery of Europe, and the loss of European significance in the world after World War II.

134. Europe Today (3). An examination of recent European history, emphasizing the trauma of decolonization, adjustment to the reality of a divided Europe, the twisting path to European unification, and the revolution in European lifestyles caused by economic prosperity.

135. European Cultural History (3). Survey of European thought from the Enlightenment to the present. Major movements in philosophy, religion, literature, art and architecture; ideologies such as conservatism, liberalism, socialism, communism, nationalism, racism and fascism. Emphasis on ideas of lasting and world-wide influence. General Education CAPSTONE Cluster, Critical Thinking.

136. European Military History From Napoleon to Hitler (3). Examination of strategic planning, tactical innovation, military systems, and campaigns from the time of Napoleon to Hitler. World wars of the 20th century with particular attention to their causes and consequences.

137. Historic Preservation (3). History of historic preservation in the United States from 1816 to the present, and an introduction to the methodology involved in identifying, researching, and protecting sites, buildings, and neighborhoods of architectural and historical significance. Includes tours of local historical sites.

138. History of the Second World War in Europe (3). A detailed examination of the military, diplomatic, political, economic, social and cultural impact of the Second World War in Europe. The causes, conduct and consequences of the war will be analyzed.

140. Modern France (3). The culture, politics, and society of France from the Old Regime to the Fifth Republic.

141. Modern Germany (3). Political and social developments from Bismarck to the present. Rise of Germany as a world power; failure of German democracy; Hitler and the Third Reich; politics of a divided Germany since 1945.

142. Tsarist Russia (3). The political, economic, and social history of Tsarist Russia from 862 to 1917.

143. The Soviet Union (3). The political, economic, and social history of the Soviet Union since 1917. General Education CAPSTONE Cluster, Critical Thinking.

144. Russian Culture (3). Russian art and literature in their historical context. Extensive use of visual material.

145. Spain and Portugal (3). Development of the Iberian Peninsula from prehistoric to modern times.

147. Eastern Europe (3). A survey of the history of East Central Europe and the Balkans.

148. Scandinavia (3). A survey of the history of Scandinavia from the age of the Vikings to the present.

149T. Studies in Modern European History (1–3; max total 6 if no topic repeated). Intensive study of special topics.

150. England to 1485 (3). Structure of the British government, society, and economic life from Roman times to The War of the Roses.

151. England and the Empire (3). Rise of England and the British nation; spread of the English-speaking peoples and the transfer of British institutions; from 1485 to the modern era.

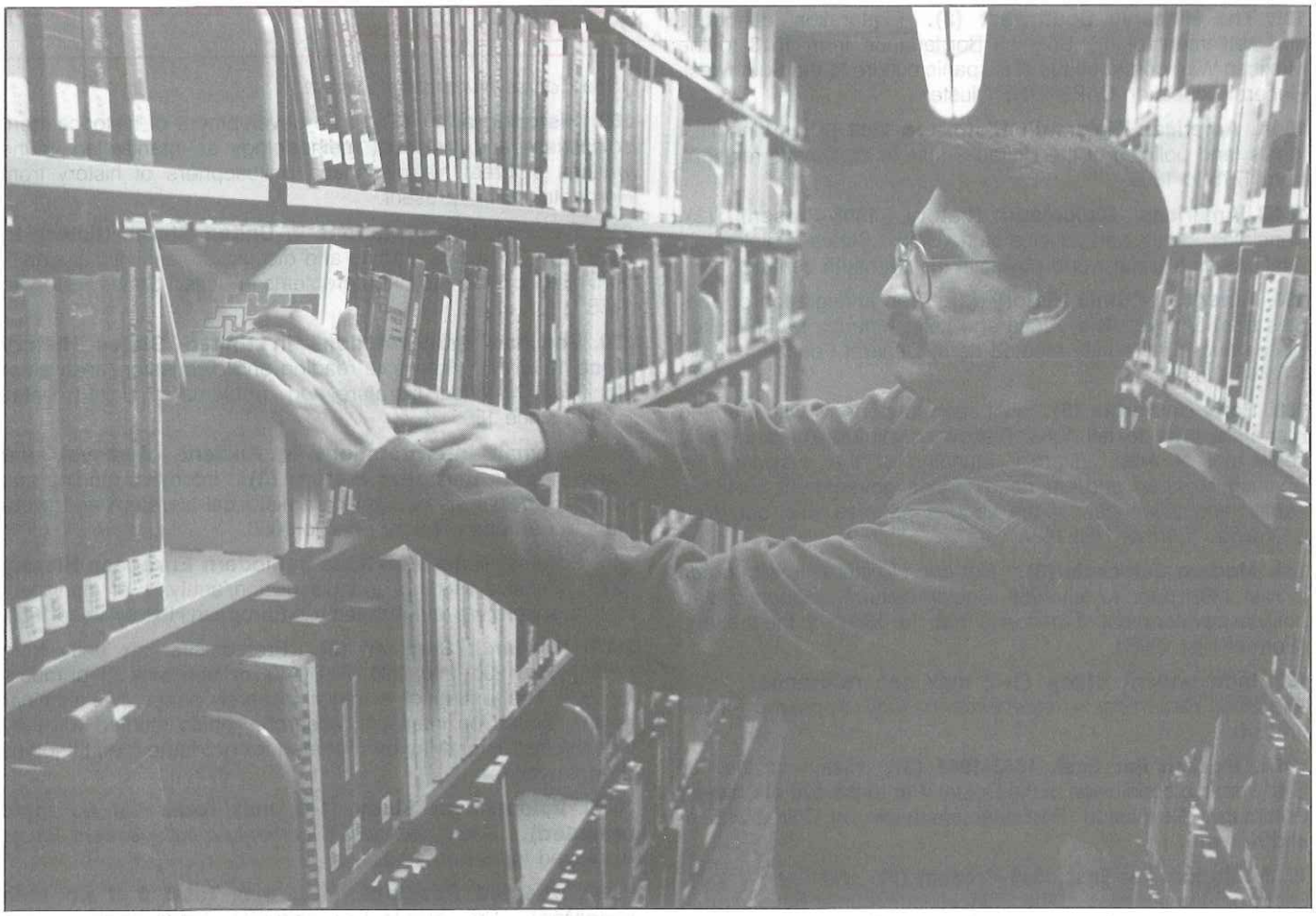
153. Canada (3). Analysis of the Canadian historical experience; from discovery, through French regime and British Empire, to modern transcontinental nation.

157. Modern Africa (3). The history of Africa since 1800. Topics given special attention include the slave trade and its abolition, European exploration, the imposition of European colonial rule, African nationalism, the struggle for independence, and Africa's rise to prominence in world affairs. General Education CAPSTONE Cluster.

160. The Great American Civilizations: Maya, Aztec, Inca (3). Historical examination of the rise and fall of the Maya, Aztec, and Inca empires. Social organization, religion, technology, art, and scientific achievements of the pre-Columbian great American civilizations.

161. Caribbean Basin (3). Emphasis on origins and evolution of the Greater Antilles and Central America. The role of the U.S. in these areas will be examined.

162. South America (3). The history of South American republics, with an emphasis on such themes as instability, economic development, political parties and revolution.



165. Modern Mexico (3). Nineteenth century origins of Mexican nationality. Development of modern Mexican culture from the Mexican Revolution to the present as compared to that of the Mexican-American. Literature and art as an expression of the new Mexican culture. General Education CAPSTONE Cluster.

166. United States — Latin American Diplomacy (3). History of the relations between the United States and Latin America, ranging from the Monroe Doctrine through the Good Neighbor Policy, Alliance for Progress and the Caribbean Basin Initiative.

169T. Studies in Latin American History (1–3; max total 6 if no topic repeated). Intensive study of special topics.

171. Early American History, 1607–1789 (3). First of a sequence of five courses covering the full period of history of the United States; colonial foundations; political and economic factors; social and cultural development through the founding of the new republic.

172. United States History, 1789–1865 (3). Political, economic, social, and cultural developments from the beginning of the republic through the Civil War.

173. United States History, 1865–1914 (3). The development of an increasingly urban and industrialized society from Reconstruction to the eve of WW I.

174A. United States History, 1914–1945 (3). The United States in world affairs; political, economic, social, and cultural developments and problems from 1914 to 1945.

174B. United States History, 1945–Present (3). The United States in world affairs; political, economic, social, and cultural developments, and problems from 1945 to present.

177. American History in Film (3). Analysis of significant films and documentaries on controversial aspects of American History. Emphasis given to placing film content in an historiographical framework. Offered especially, but not exclusively, for prospective teachers.

178. History of African-Americans (3). (See Af Am 178.)

179T. Studies in United States History (1–3; max total 6 if no topic repeated). (Same as W S 179T.) Intensive study of special topics.

180. United States Military History (3). An overview of American military history, with emphasis on the 20th century. Tactical and strategical analysis of American participation in armed conflicts. Study of the impact of technology and the evolution of tactics.

181A. Westward Movement to 1848 (3). The challenge of free land; development of British and United States western policies; problems of American migration to the interior, effects of the frontier environment upon the culture of the West.

181B. Westward Movement Since 1848 (3). Patterns of exploitation; role of the federal government in the West: land policy, Indian policy; problems of communication; economic growth.

183. The Hispanic Southwest (3). Exploration, conquest, and settlement of the Spanish Borderlands from 1513 to the Mexican War; contributions of Hispanic culture to the Southwest. General Education CAPSTONE Cluster.

184A. American Diplomatic History to 1898 (3). Principles, ideals, and policies of the United States in diplomatic relations from 1775 to 1898.

184B. American Diplomatic History, 1898–Present (3). Principles, ideals, and policies of the United States in diplomatic relations as a great world power in the twentieth century.

186. American Ethnic History (3). The immigration of peoples from Europe, Asia, Africa and Latin America to the United States and the life they created here. General Education CAPSTONE Cluster.

188. Early California (3). Not open to students with credit in Hist 189A prior to fall 1986. Discovery, exploration, and early settlement of Alta California, founding of the missions; the Spanish, Mexican, and American periods; government, customs, habits, and influences of the various peoples who occupied California. (Former Hist 189A)

189. Modern California (3). Not open to students with credit in Hist 189B prior to fall 1986. Social, cultural, economic, and political development of California from the 1860's to the present. (Former Hist 189B)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

191A. Modern Far East, 1843–1949 (3). History of the Far East from the conclusion of the Opium War to the eve of Chinese Communist Revolution. Particular emphasis on China, Japan, and Korea.

191B. Modern Far East, 1949–Present (3). History of the Far East from the success of the Chinese Communist Revolution in 1949 to the present. Particular emphasis on China, Japan, Korea, and Vietnam.

198. Directed Reading (1–3; max total 3 if no area repeated). Prerequisite: upper-division standing. Readings on selected themes, problems, and topics in consultation with a faculty adviser.

199T. Studies in Far Eastern History (1–3; max total 6 if no topic repeated). Intensive study in special topics.

GRADUATE COURSES

(See *Course Numbering System.*)

200. Historiography (3). The development of historical consciousness and historical methodology as manifested in the writings of great historians and philosophers of history from Herodotus to the present.

210. Seminar: Interpretations in United States History to 1865 (3). Intensive reading and discussion/analysis of significant historical literature and problems in United States History to 1865.

220. Seminar: Interpretations in United States History since 1865 (3). Intensive reading and discussion/analysis of significant historical literature and problems in United States History since 1865.

230. Seminar: Interpretations in Ancient, Medieval, and Early Modern European History (3). Intensive reading and discussion/analysis of significant historical literature and problems in European History prior to 1650.

240. Seminar: Interpretations in Modern European History (3). Intensive reading and discussion/analysis of significant historical literature and problems in European History since 1650.

280T. Research Seminar (3). Prerequisite: six units from among Hist 200, 210, 220, 230, 240, or approval of graduate adviser. The writing of a major research paper in a seminar setting, based on intensive research. Topics studied will vary with the instructor. May be repeated for graduate credit if topics do not overlap.

*** 290. Independent Study (1–3; max total 6 if no topic repeated).** See *Academic Placement — Independent Study.* Approved for *SP* grading.

*** 292. Directed Readings (1–3; max total 6 if no area repeated).** Prerequisite: See instructor. Readings on selected themes and topics in consultation with a faculty adviser. *CR/NC* grading only.

299A–B. Thesis (3–3). Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. *A.* Thesis design. *B.* Thesis writing. *A* and *B* may be taken concurrently. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

300. Topics in History (2; max total 8 if no topic repeated). Selected topics in various fields of history, e.g., European, The Americas, United States, non-Western.

* (Maximum total for History 290 and 292 combined is 9 units if no area repeated.)

HUMANITIES
Interdisciplinary Minor



School of Arts and Humanities
Department of Foreign Languages
San Ramon 4, Room 131
(209) 278-2386

The minor in Interdisciplinary Humanities surveys relationships among philosophy, literature, music, architecture, sculpture, and painting. It also makes some use of science, popular culture, contemporary events and whatever else relevant that may come to hand in order to explore as richly as possible the interrelationships among arts and ideas. And it does so for entire cultures, subdivided, of course, into their major periods.

Faculty

Bruce S. Thornton,
Program Coordinator
Kathryn L. Bumpass, *Music*
George E. Diestel,
Speech Communication
Jose A. Elgorriaga,
Foreign Languages
June M. Gill,
Foreign Languages
Victor Hanson,
Classical Studies
Dickran Kouymjian,
Armenian Studies
John J. McDermott,
English
David T. Natharius,
Speech Communication
Manuel Pena,
Foreign Languages
Joseph Satin
Foreign Languages

Requirements for the Minor

Twenty-one units in interdisciplinary humanities study to be selected as follows:

	Units
Hum 10, 11 or 12	3
IntD 104, 108, 112 or 116	6
IntD 123, 124 or 130	3
Hum 140 or 150	3
Electives (Select from remaining humanities courses or from other pertinent courses approved by the faculty adviser.)	6
	21

COURSES

Humanities (Hum)

1T. Topics in Humanities (1–4). (Same as Hum 101T.) Selected topics in the humanities not normally covered by regular course offerings.

10. Introduction to the Humanities (3). Interrelationships among art, literature, music and philosophy, from Greece and Rome through the Renaissance. General Education BREADTH, Division 6.

11. Introduction to the Humanities (3). Interrelationships among art, literature, music, and philosophy, from the 17th century Age of Reason to the present. General Education BREADTH, Division 6.

12. Introduction to Asian Humanities (3). Interrelationships among the verbal and non-verbal arts, the wisdom literature, and the religions of India, China and Japan. General Education BREADTH, Division 6.

101T. Topics in Humanities (1–4). (See Hum 1T.)

140. Tradition and Change in China and Japan (3). (Same as Anth 186.) This course examines the current aspirations and problems of the Chinese and Japanese in terms of their traditional cultures, and explains how their histories, values, world views and intellectual traditions affect their lifestyles and their international relations today. General Education CAPSTONE Cluster.

150. Indic Cultures and Traditions (3). (Same as Ling 110.) Study of the cultures and traditions of the Indian Subcontinent as part of the common human heritage, and for informed perspectives on international issues. Understanding of peoples of South Asia: their lifestyles, world views and experiences; the development of their intellectual, aesthetic and spiritual traditions; and their current aspirations and problems. General Education CAPSTONE Cluster.

CAPSTONE: INTERDISCIPLINARY (IntD)

104. Humanities in the Middle Ages and Renaissance (3). An examination of art, literature, philosophy, and music and their interrelationships in European culture during the Middle Ages and Renaissance. Critical Thinking course.

108. Humanities in the Ancient World (3). An examination of art, literature, philosophy, and music and their interrelationships in the Ancient world (Sumer, Babylonia, Ancient Egypt, Ancient Greece). Critical Thinking course.

112. Humanities During the Baroque and Enlightenment (3). An examination of European and American art, literature, philosophy, and music and their interrelationships during the period from the late 16th century through the 18th century.

116. Humanities in the Modern World (3). An examination of art, literature, philosophy, and music and their interrelationships in the Western world during the 19th and 20th centuries. Critical Thinking course.

123. The American Experience: Beginnings to WWI (3). Survey of the principal experiences and intellectual movements that have formed the American character, as illustrated through American literature, music, and the arts, serious and popular, from the formation of the colonies to the outbreak of WWI.

124. The American Experience: WWI to the Present (3). Survey of the principal experiences and intellectual movements that have formed the American character, as illustrated through American literature, music, and the arts, serious and popular, from WWI to the present time. Critical Thinking course.

130. Latin American Cultures and Traditions (3). A study of Hispanic cultural and aesthetic trends and practices as seen in the popular and formal arts and other styles of Hispanic thought, feeling and expression.

IN-SERVICE COURSE

(See *Course Numbering System.*)

300T. Topics in Humanities (1–3; max total 12 if no topic repeated). Selected areas in humanities.

Journalism

School of Arts and Humanities
Department of Journalism
James B. Tucker, Chair
McKee Fisk Building, Room 237
(209) 278-2087

B.A. in Journalism
Minor in Journalism
Sequences in:
- **Advertising**
- **News-Editorial**
- **Photocommunication**
- **Public Relations**
- **Radio-Television News Communication**



Journalism is essential to democracy. The principle that only a free press can provide the diversity of ideas necessary to discover truth is fundamental to Western civilization. The Department of Journalism bases its courses of study on that principle.

The department has two main goals: (1) to teach its students how to express themselves with the clarity and precision needed to convey the information vital to the survival of a democratic society, and (2) to instill in students the sense that journalism is a craft whose members continually question not only the decisions of society's leaders, but also the professional standards of journalists themselves.

Program

The department offers courses that emphasize intensive skills training as well as courses that raise serious questions about topics such as concentration of media ownership, ethical and philosophical issues, changes in communications law, the effects of broadcast media, and the impact of the computer on society.

The department offers five sequences of study: (1) news-editorial and (2) radio-television news communication, both of which stress effective news-gathering techniques and the development of a clear writing style; (3) public relations, which focuses on developing communication skills that will create better understanding between institutions and the general public; (4) advertising, which involves communication skills in the marketing of consumer goods and services and in the disseminating of other information; and (5) photocommunication, which emphasizes photography and the visual elements of mass media.

As part of its program, the department publishes a weekly laboratory newspaper, *Insight*. Students in several journalism classes produce stories, photographs, and advertising for *Insight* and also handle the production processes.

Graduate Program

An interdisciplinary graduate program for the Master of Arts degree in Mass Communication is jointly offered by the Department of Journalism and the Telecommunications Program. See *Special Programs — Graduate Studies.*

Accreditation and Affiliations

The news-editorial and public relations sequences are accredited by the Accrediting Council on Education in Journalism and Mass Communications. The department is a member of the Association of Schools of Journalism and Mass Communication. Student organizations include chapters affiliated with the Society of Professional Journalists (Sigma Delta Chi), the American Advertising Federation, and the National Press Photographers Association.

Career Placement

The department assists graduating seniors in job placement through individual counseling and job referrals. Faculty members work actively with media employers to help students find positions in journalism and related fields. Students are encouraged to extend their classroom instruction by seeking internships in their selected fields of interest. More information on internships may be obtained from the department.

Facilities

The department has computerized typesetting equipment that is used in classes and in the production of *Insight,* the department's weekly laboratory newspaper. Other facilities include an Associated Press teletype machine and well-equipped laboratories for photography, news writing, and layout and design. The department also maintains a student reading room stocked with an extensive selection of major American newspapers, magazines, trade publications and scholarly journals. Journalism students have the opportunity to work independently in paid positions on *The Daily Collegian*, the university's student newspaper, and on KFSR-FM, the university's radio station.

Faculty

James B. Tucker, *Chair*

Paul D. Adams
Roberta R. Asahina
George A. Flynn
D. Gregory Lewis
Dayle H. Molen
Emma P. Oshagan
B. Schyler Rehart, Jr.
Gregory T. Wuliger
John D. Zelezny

All full-time faculty members have had professional experience in their respective areas of specialization, and all hold advanced degrees in journalism or a related field. The department supplements its full-time staff with several part-time faculty members, many of whom are practicing local journalists.

An Overview of the Journalism Major

	Units
1. Courses in Journalism (24 units must be upper division)	33
2. General Education Requirement	51
3. Department of Journalism's Liberal Arts and Sciences Requirement	15
4. Additional Electives (none may be in journalism or telecommunications or in any course in which the main emphasis of content is mass communications)	25
Total	124

Three core courses (Journalism 1, 8, and 114) are required of all journalism majors. (See Note 1.) In addition, each journalism major eventually must select a sequence, which is an area of specialization within the major. Each sequence is designed to allow for extensive exploration in other subject areas beyond the requirements of general education and the major. The journalism major also requires 9 units of journalism electives.

Regular contact with a journalism faculty adviser is essential if a journalism major wants to ensure normal progress toward a degree. Students are encouraged to get acquainted with their advisers as soon as possible after beginning their studies at CSU, Fresno. The department recommends that all journalism majors meet with their advisers every semester before each new registration period begins. Students may obtain the names of their advisers by checking with the department.

Summary of Degree Requirements

All journalism majors should be aware of the following requirements for completion of the Bachelor of Arts degree in Journalism:

1. The university requires 124 total units for graduation, 51 of which must be in general education as specified in the university's General Education requirements and 40 of which must be upper division.
2. The Department of Journalism requires 33 units of approved journalism courses for completion of the journalism major. The 33 units are broken down into 9 units of core courses, 15 units of required journalism courses in a chosen sequence of study, and 9 units of approved journalism electives. (Approval of journalism electives is obtained by seeing a journalism faculty adviser.) Journalism majors who wish to take more than 33 units of journalism must understand that journalism units in excess of 33 will not apply to the 124 units required for graduation.
3. The General Education requirement (51 units) plus the journalism major requirement (33 units) totals 84 units, which leaves 40 additional units required for completion of the 124-unit degree requirement. Of these 40 remaining units, 15 must be taken to satisfy the Department of Journalism's "Liberal Arts and Sciences" requirement. Courses used to satisfy the Liberal Arts and Sciences requirement are subject to the following restrictions:
   a. Courses taken to satisfy the department's Liberal Arts and Sciences requirement shall be selected from academic disciplines in the schools of Arts and Humanities, Social Sciences, and Natural Sciences.
   b. All courses used to satisfy the department's Liberal Arts and Sciences requirement must be approved by a journalism faculty adviser. Students should seek this approval in advance to be sure they are taking acceptable courses. Transfer students should seek an advising session in the Department of Journalism as soon as possible after transferring to determine their Liberal Arts and Sciences requirement status.
   c. The department's Liberal Arts and Sciences requirement cannot be met by courses that involve skills or production.
4. Completion of General Education (51 units), the journalism major (33 units), and the Department of Journalism's Liberal Arts and Sciences requirement (15 units) totals 99 units, which leaves 25 additional units required to meet the university's 124-unit graduation requirement.

   Students are encouraged to use these 25 units for additional study in liberal arts and sciences. Students in the advertising and public relations sequences may want to use some of the 25 units to take certain courses in business.

   These 25 units shall not be in journalism or telecommunications and shall not be in any course, regardless of departmental classification, in which the emphasis of study is mass communications or the preparation of mass media messages. For example, a political science course on "politics and mass media" would not qualify; nor would an advertising course in a marketing department.

Sequences (select one)

Advertising

	Units
1. *Core courses:* Jour 1, 8, 114	9
2. *Required journalism courses:* Jour 113, 145, 146, 155, 175	15
3. *Journalism electives* (at least 6 units must be upper division)	9
	33

Students in the advertising sequence are encouraged to concentrate their outside electives in arts and humanities, social sciences, and natural sciences. Certain business courses, especially marketing, also are recommended. Outside electives in which mass communications is the main content will not be accepted toward the 124-unit degree requirement. Additional direction on outside electives may be obtained from a journalism faculty adviser.

News-Editorial

	Units
1. *Core courses:* Jour 1, 8, 114	9
2. *Required journalism courses:* Jour 100W, 110, 181, 184, 188	15
3. *Journalism electives* (at least 6 units must be upper division)	9
	33

Students in the news-editorial sequence are encouraged to concentrate their outside electives in arts and humanities, social sciences, and natural sciences. Outside electives in which mass communications is the main content will not be accepted toward the 124-unit degree requirement. Additional direction on outside electives may be obtained from a journalism faculty adviser.

Photocommunication

	Units
1. *Core courses:* Jour 1, 8, 114	9
2. *Required journalism courses:* Jour 17, 100W, 116, 117, 187	15
3. *Journalism electives* (all must be upper division)	9
	33

Students in the photocommunication sequence are encouraged to concentrate their outside electives in arts and humanities, social sciences, and natural sciences. Outside electives in which mass communications is the main content will not be accepted toward the 124-unit degree requirement. Additional direction on outside electives may be obtained from a journalism faculty adviser.

Public Relations

	Units
1. *Core courses:* Jour 1, 8, 114	9
2. *Required journalism courses:* Jour 100W, 110, 113, 145, 173	15
3. *Journalism electives* (at least 6 units must be upper division)	9
	33

Students in the public relations sequence are encouraged to concentrate their outside electives in arts and humanities, social sciences, and natural sciences. Certain business courses also are recommended. Outside electives in which mass communications is the main content will not be accepted toward the 124-unit degree requirement. Additional direction on outside electives may be obtained from a journalism faculty adviser.

Radio-Television News Communication

	Units
1. *Core courses:* Jour 1, 8, 114	9
2. *Required journalism courses:* Jour 100W, 128, 130, 153, TCOM 30 or 50	15
3. *Journalism electives* (all units must be upper division)	9
	33

Students in the radio-television news communication sequence are encouraged to concentrate their outside electives in arts and humanities, social sciences, and natural sciences. Outside electives in which mass communications is the main content will not be accepted toward the 124-unit degree requirement. Additional direction on outside electives may be obtained from a journalism faculty adviser.

Notes

1. Core Courses: Journalism 1 may be taken at any time, but majors are encouraged to take it during the freshman or sophomore year. Journalism 8 may be taken as early as the second semester of the freshman year, but taking it as a sophomore or even as a first-semester junior will keep a fulltime journalism major on schedule for graduation in four years. Journalism 114 is usually taken by journalism majors during the junior or senior year.
2. Transfer Units: Up to nine units of community college journalism courses may be accepted as being equivalent to lower-division requirements in the department. Community college transfer students are encouraged to meet with an adviser in the department to obtain further information.
3. Language Qualification Examination: A screening examination administered by the department must be passed before permission will be given for enrollment in Journalism 8 and in most of the department's other writing and editing courses. (See prerequisites for each course before attempting to enroll.) Students who do not pass the Language Qualification Examination may retake it the following semester.
4. Permission Courses: Many of the department's courses require permission of the instructor before enrollment. The department opens its permission lists on the first day of the early registration period during the semester preceding actual enrollment.
5. *CR/NC* grading is not permitted in the journalism major.
6. General Education and elective units may be used toward a dual major or minor (see *Dual Major* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
7. Students enrolled in the department's writing and reporting classes must be able to type.
8. Advising: Students are urged to see their adviser at least once each semester to make sure they are meeting the department's graduation requirements. Students may obtain the name of their adviser by checking with the department during their first semester of enrollment.
9. Graduation Approval: As a journalism student approaches the senior year, he or she must see a journalism adviser to set up a contract for graduation approval. Failure to establish a contract may result in delay of graduation.

Journalism Minor

A minor in journalism consists of 18 units including a required core of 6 units and 12 units in one of the sequences.

CORE	Units
Jour 8, 114	6

Sequences:

Advertising

Jour 145, 146, 155	9
Journalism electives	3
	12

News-Editorial

Jour 100W, 110, 188	9
Journalism electives	3
	12

Photocommunication

Jour 17, 100W, 117	9
Journalism electives	3
	12

Public Relations

Jour 100W, 113, 173	9
Journalism electives	3
	12

Radio-Television News Communication

Jour 100W, 128, 130	9
Journalism electives	3
	12
Total	18

Master of Arts Degree in Mass Communication

The graduate program leading to the Master of Arts degree in Mass Communication with emphasis in the print media is based upon undergraduate work in journalism. For requirements, consult the department chair; for courses see *Special Programs.* Detailed information about the graduate program may be obtained from the Office of the Division of Graduate Studies and Research.

COURSES

Journalism (Jour)

1. Mass Communications (3). Survey of the mass media of communication, including newspapers, magazines, radio and television; related agencies and fields of communicative enterprise, such as press associations, feature syndicates, advertising and public relations. (CAN JOUR 4)

2. Interpreting Current Events (3). Analysis and discussion of major world news events as they occur with readings from periodicals reflecting various shades of opinion; analysis of various media for objectivity, emphasis and political or nationalistic coloration.

5. Basic Editing (3). Open only to journalism majors. Recommended for all journalism majors who do not pass the language qualification test. Application of basic language skills to journalistic writing and editing.

8. Journalistic Writing (3). Prerequisite: pass language qualification test, at least second-semester freshman standing. Preparation of varied news stories with speed and accuracy; introduction to basic news sources; techniques of interviewing; problems encountered by reporters; ethical and legal considerations. (2 lecture, 2 lab hours) (CAN JOUR 2)

17. Beginning Photojournalism (3). Survey and instruction in beginning photojournalism. Characteristics of the journalistic photograph and its role in publications. Instruction in use of cameras and laboratory technique for black-and-white photographs. (2 lecture, 3 lab hours)

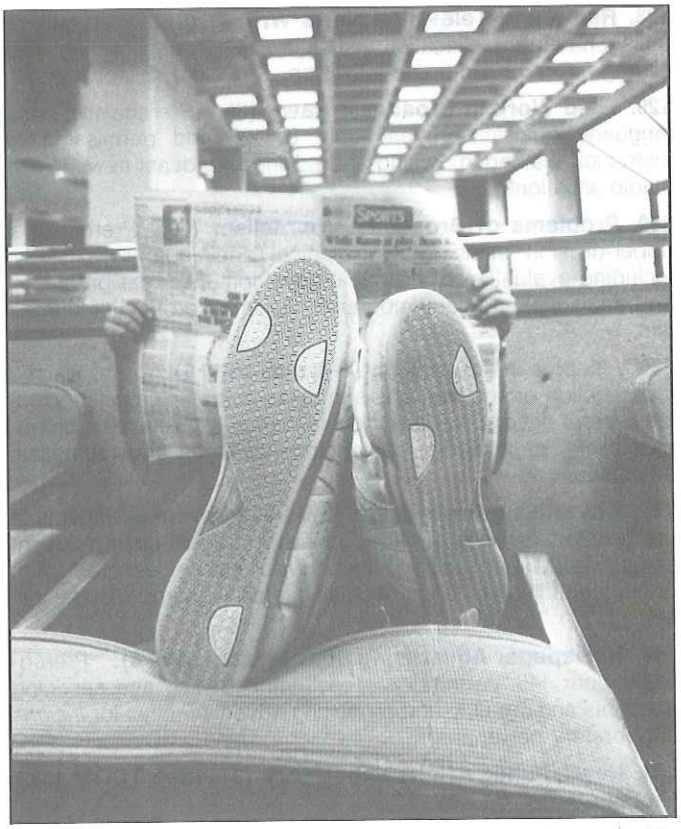
100W. Reporting (3). Prerequisite: pass language qualification test, Jour 8, Engl 1. Analysis of news sources; techniques of interviewing applied to specific reporting situations; coverage of campus and community functions in the preparation of articles for publication. Meets the upper-division writing skills requirement for graduation. (2 lecture, 2 lab hours)

106. Desktop Publishing (3). Survey, design and editing of specialized publications such as newsletters, brochures and other materials for editorial, advertising and public relations purposes. Emphasis on computerized production techniques. (2 lecture, 2 lab hours)

110. Advanced Reporting (3; max total 6). Prerequisite: pass language qualification test, Jour 8, 100W. Practice in handling advanced news writing and reporting assignments in a newsroom environment; preparation of interpretative and investigative articles for publication. Department newspaper used for laboratory purposes. (8 lab hours, 4 hours arranged)

113. Public Relations (3). Development of public relations practice; principles and methods; application in business, education and other fields.

114. Editing of Publications (3). Prerequisite: pass language qualification test, Jour 8. Editing copy; writing headlines; using type effectively; handling wire service copy; laying out newspaper pages. (2 lecture, 2 lab hours)



115. Media Stereotypes (3). (See TCOM 115.)

116. Photo Editing (3). Study of photographs and other visual elements in publications; principles of graphic design. Practical experience in the selecting of photographs and of design elements for content, aesthetic values and technical quality.

117. Intermediate Photojournalism (3). Prerequisite: Jour 17. Study and practice of photojournalism; evaluation of photographs for publication; field and laboratory experience; emphasis on lighting, lenses and special processing methods. (2 lecture, 3 lab hours)

120. Newspaper Workshop (3; max total 6). Prerequisite: permission of instructor. Practice in editorial leadership and newspaper production techniques. Department newspaper used for laboratory purposes. (1 lab hour, 10 hours arranged)

124W. Magazine Feature Writing (3). Prerequisite: pass language qualification test, Engl 1. Writing and marketing feature material for magazines, newspaper supplements and syndicates. Meets the upper-division writing skills requirement for graduation.

126. Critical Writing (3). Prerequisite: pass language qualification test, Jour 8, 100W. Critical analysis of structure and content of editorials, other opinion pieces and interpretative articles. Practice in writing editorials and critical essays. (2 lecture, 2 lab hours)

127. Multimedia Journalism (3). Prerequisite: permission of instructor. Survey and practice in multimedia communications, especially as a public relations or advertising tool. Emphasis placed on slide-tape and its production.

128. Radio and Television News Writing (3). Prerequisite: pass language qualification test, Jour 8. Gathering, writing, and editing news for radio and television. (2 lecture, 2 lab hours)

129. Field Work in Broadcast News (3). Prerequisite: pass language qualification test, Jour 8, 128 and permission of instructor. Gathering, writing and editing broadcast news in live studio situations.

130. Problems of Broadcast Journalism (3). Prerequisite: upper-division standing. Sociological and journalistic study, including evaluation of historical development, legal problems, and traditional and contemporary criticism of broadcast journalism.

139T. Topics in Journalism (1–3; max total 6). Analysis and investigation of selected areas in mass communications including current developments in advertising, public relations, broadcast news, print media, photocommunications and journalism education.

145. Advertising Procedures (3). Overview of all aspects of the field of advertising. Study of history, agent-client relationships, media, relationship to the behavioral sciences, production of copy and layouts, and advertising legislation and responsibility.

146. Newspaper Advertising Staff (3; max total 6). Prerequisite: Jour 145, permission of instructor. Selling and servicing accounts and creating and producing advertisements for *Insight,* a laboratory newspaper.

153. News/Public Affairs Laboratory (3). (See TCOM 153.) (Former R-TV 142, Jour 142)

155. Print Advertising Copy Writing (3). Prerequisite: Jour 145, permission of instructor. Print advertising copy writing for variety of print media. The role of the copy writer; development of creative strategy; laws regulating print advertising.

160. Advertising Media (3). Prerequisite: Jour 145. Media planning and buying for advertising media. Evaluating and selecting media to meet specific marketing and communication goals; designing specific media plans and making buys in various media.

165. Broadcast Advertising Copy Writing (3). Prerequisite: Jour 145, permission of instructor. Radio and television advertising copy writing. Technical and format considerations; the role of the broadcast copy writer; development of creative strategy; laws regulating broadcast advertising.

173. Public Relations: Programs and Problems (3). Prerequisite: Jour 8, 100W, 113. Development, assessment and evaluation of public relations in business, education, philanthropy and other field practice.

175. Advertising Campaigns (3). Prerequisite: Jour 145, 155. Background, planning and preparation of advertising campaigns. Term campaign, in advertising agency groups, with client-agency setup; analysis of campaigns and their effectiveness.

180. Journalism Ethics (3). Study of ethical choices made by journalists in the context of the political, social and economic structure of U.S. communications systems. Also emphasizes applying traditional ethical theories to current media issues and problems. (Former Jour 139T section)

181. Laws of Communication (3). Study of federal and state laws as applied to the media, including such topics as freedom of information acts, libel, right of privacy, fair trial-free press, copyright, obscenity, advertising regulation and broadcast regulation.

182. The Press and World Affairs (3). The role of the world press, radio and television in national and international affairs.

183. Public Opinion and Propaganda (3). Examination of theories of persuasion, traditional views of propaganda and more recent formulations of propaganda as part of the process of social integration. Discussion of research methods, the role of advertising in forming opinions and the ethical dilemmas of persuasion.

184. History of Journalism (3). Historical background of the American press from colonial to modern times.

186. Mass Media and Society (3). Impact of mass media on society. Includes problems, contributions, criticisms and contemporary issues of the mass media.

187. Advanced Photojournalism (3; max total 6). Prerequisite: Jour 17, 117, and permission of instructor. Individualized study and practice in advanced skills including lighting, color, laboratory techniques and electronic imagery.

188. Reporting of Public Affairs (3). Prerequisite: pass language qualification test, Jour 8, 100W. Methods and field work in reporting courts and municipal, county, state and federal governments. (2 lecture, 2 lab hours)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

193. Field Work in Public Relations (3). Prerequisite: Jour 8, 100W, 113 and permission of instructor. Supervised work experience in public relations. Reports made regularly to instructor.

196. Public Relations Practice (1–3; max total 3). Prerequisite: permission of instructor. Internship in public relations with agencies, institutional offices, organizations or other media. Reports made regularly to instructor. Approved for *SP* grading.

197. Photocommunication Practice (1–3; max total 3). Prerequisite: permission of instructor. Internship on regional newspapers, television stations, advertising agencies or other media which use photocommunication. Reports made regularly to instructor. Approved for *SP* grading.

198. Newspaper Practice (1–3; max total 3). Prerequisite: permission of instructor. Internship on regional newspapers and radio and television stations. Reports made regularly to instructor. Approved for *SP* grading.

199. Advertising Practice (1–3; max total 3). Prerequisite: permission of instructor. Internship in advertising departments of regional mass media and with advertising and public relations agencies. Reports made regularly to instructor. Approved for *SP* grading.

GRADUATE COURSES

See *Special Programs.*

IN-SERVICE COURSE

(See *Course Numbering System.*)

353. Topics in Journalism (1–3; max total 9 if no topic repeated). Selected topics of study in various aspects of mass communication including advertising, public relations, broadcast news, magazines, print media, photo communication and journalism education.

Liberal Studies

School of Education and Human Development
Liberal Studies Program
Dr. Jacques S. Benninga, Coordinator
Ed/Psych Building, Room 111
(209) 278-3974

B.A. in Liberal Studies
Multiple Subject Credential (Option I)
Emphasis in:
Bilingual Education
Early Childhood Education (Option II)

The primary mission of the Liberal Studies Program is to provide a strong knowledge-based education in the liberal arts that will provide subject matter preparation for elementary teaching or foundation preparation for other professions such as law, medicine, journalism and various fields of public service.

Faculty

Because of the nature of the degree program, faculty represent a broad cross-section of academic disciplines. At present, 39 different departments offer courses that can be applied toward this major. The initial point of contact is the Liberal Studies adviser, located in the Educational/Psychology Building, Room 111.

Programs

Credential Programs. The Liberal Studies student who wishes to complete a credential program that will lead to authorization to teach in an elementary school must follow a specific course of study.

Credential programs that are available to Liberal Studies students who complete all requirements within a degree program are listed below:

Preliminary Multiple Subject Credential — called Option I, is taken by most Liberal Studies students and requires completion of a Liberal Studies major, which includes 30 units of Professional Education Core courses that are taken as electives.

Preliminary Multiple Subject Credential-Bilingual/Cross-Cultural Emphasis — requires completion of a bachelor's degree with the Liberal Studies major, completion of 9 units of additional courses (including 6 in Chicano and Latin American Studies and 3 in Linguistics in the major Breadth area), and completion of 30 units of Professional Education Core courses.

Preliminary Multiple Subject Credential-Early Childhood Education Emphasis — called Option II, requires that students complete a Liberal Studies major program which includes 30 units of Professional Education Core courses designed specifically for early childhood education teachers and included as the elective components of this degree program.

Preprofessional Program. Liberal Studies students who are interested in obtaining a strong academic foundation that will serve as entry to other people-oriented (non-teaching) professions, such as journalism, law, medicine, etc., normally follow a specially-designed program that provides optimal experience in general education and preprofessional training. This program should be planned in consultation with the Liberal Studies adviser.

Career Opportunities

Liberal Studies majors preparing for careers in elementary teaching should expect to find a favorable job market. Recent statistical reports for the Central Valley provide evidence that the area population is continuing to grow along with the number of school-aged children. This pattern of growth, along with anticipated attrition from the teaching profession, provides ample support of a continuing need for well-prepared, credentialed elementary teachers.

The Liberal Studies major not planning a career in teaching will find that a number of area employers are seeking prospective employees with a broader vision of the world, not normally provided by a narrow specialization. Opportunities are available in people-oriented jobs such as public relations, personnel, medicine, etc.



Liberal Studies candidates are provided expert assistance from the campus Career Development and Employment Services as they prepare for entrance into the teaching profession or other people-oriented careers. Assistance in preparing placement files, preparing for job interviews, and searching for suitable employment is readily available for each candidate.

Advisement. Liberal Studies majors are strongly encouraged to meet with the Liberal Studies adviser (EdP 111) prior to or at the beginning of enrollment in the program at CSU, Fresno. (Normally no later than the first two weeks of the semester.) Early consultation with the Liberal Studies adviser will enable the student to complete the program within the most reasonable time limit and assure a well-planned sequence of courses leading toward a degree and appropriate preparation for the intended professional or career goal.

Transfer Students. Students transferring from other college and university settings may find it necessary to take additional units to meet the Breadth requirement for the Liberal Studies major. Transfer students are urged to make an appointment with the Liberal Studies adviser upon receipt of the official university evaluation sent from the CSU, Fresno Evaluations Office.

Credit/No Credit. Liberal Studies majors may take up to 24 units (12 units in the major and 12 units of electives) of credit/no credit courses and apply them to a bachelor's degree. It is important to note that students intending to complete all of the requirements for the Preliminary Multiple Subject Credential (elementary teaching) within the bachelor's degree normally take 17 units of required *CR/NC* courses. They are listed below:

Course	Units	Grade
T Ed 50	2	*CR/NC*
T Ed 110	3	*CR/NC*
T Ed 160	12	*CR/NC*

After completing the above courses (required for the Multiple Subject Credential candidate), the Liberal Studies major would have only 7 additional units that could be taken with *CR/NC* grading.

Scholarship Requirement. Liberal Studies majors who plan to obtain a Multiple Subject Credential (elementary teaching) must obtain a GPA of 2.89 or better as a condition for admission to a teacher education program. The GPA for the Multiple Subject applicant is calculated as a cumulative average of all college coursework taken if the total number of units obtained at CSU, Fresno is less than 30.

However, if the total number of units completed at CSU, Fresno exceeds 30, the GPA is calculated only on the units of credit earned while enrolled at CSU, Fresno. For additional information regarding admission to the Multiple Subject Credential program, please contact the School of Education and Human Development Admission and Records Office (EdP 120).

Upper-Division Writing Skills (UDWS) Requirement. To meet the UDWS requirement for a bachelor's degree, the student must either receive a passing score on the Upper-Division Writing Examination (UDWE) or pass English 160W/Writing Workshop with a grade better than *C* or *Credit (CR)*. The writing requirement (UDWE) or English 160W must be met **after** the student has completed 56 units of coursework.

Registration for the UDWE must be done in the University Testing Office, 1700 E. Bullard (northwest corner of Cedar and Bullard).

Liberal Studies Major — Program Components

The Liberal Studies major consists of 6 main program components. These components are listed below.

Program Component	Options I and II	Bilingual Emphasis
	Units	*Units*
I. Core	18	18
II. Breadth (to include one upper-division course after 56 units)	27	27*
III. General Education CAPSTONE (upper division)	6	6
IV. Liberal Studies Major	24	27
V. Additional Major	15	15
VI. Electives	34	31
TOTAL	124	124*

* Total units depend on the Spanish needed for the Bilingual Emphasis.

Liberal Studies Program Components — Course Content

Additional information pertaining to each of the Liberal Studies program components is provided below:

I Liberal Studies Core (18 Units)

The Liberal Studies Core consists of courses in fundamental skills and knowledge. Core requirements are listed below:

A. English 1
B. Speech 3, 7, or 8
C. Math 45 recommended
D. Critical Thinking: Phil 25 or 45 recommended
E. History 11 or 12
F. Political Science 2 or 101

Total 18 units

II Liberal Studies Breadth (27 Units)

This component is the same as the university General Education BREADTH requirement exposing the student to a variety of disciplines within the structured framework of Divisions 1–9.

While the student may elect to take coursework identified in the university General Education program, the program listed below is highly recommended.

Division 1: Geol 1, Phys 10, or P Sci 21
Division 2: Biol 10, Bot 10, or Zool 10
Division 3: Psych 10 recommended
Division 4: Drama 22, Art 13, 20, 30, 40, 50, 60, 70, CFS 38, Psych 171, or Spch 4
Division 5: Art H 10, 11, Music 9, 74, Drama 163, CLS 7 or 9
Division 6: Hist 1, 2, Hum 10, 11, Engl 20, 30, 101, 102, 103, Phil 1 or 120
Division 7: Ling 10 or 6 introductory units of one foreign language
Division 8: Soc 1, Anth 2, or Geog 4
Division 9: Any division 9 course (Note: Bilingual program students take CLS 3 and 5)

Note: This area must include at least 3 units of upper-division coursework taken after the completion of 56 units of study.

Total 27 units

III General Education CAPSTONE — Upper Division (6 Units)

This component can be taken only after 56 units have been completed.

For specific CAPSTONE courses, refer to the General Education CAPSTONE section in this catalog.

IV Liberal Studies Major (24 Units)

Liberal Studies upper-division courses are selected from four main areas including: I English, II Humanities, III Mathematics and Science, and IV Social Science. The requirements and course offerings for each area are listed below:

Area I. English — Select 6–12 units in upper-division courses from one or two of the following disciplines: English or Linguistics or Speech.

HIGHLY RECOMMENDED: Linguistics 146; Speech 114; or English 101, 102, or 103 (bilingual students must take Linguistics 132 and 141).

Area II. Humanities — Select 6–12 units in upper-division courses from one or two of the following disciplines: art, African-American Studies, drama, one foreign language, Chicano and Latin American Studies, music, philosophy.

HIGHLY RECOMMENDED: at least two from Music 153, 155; Drama 136, 137, 138; P E 152. Bilingual students must take Spanish 122, 118 (120 if not a native speaker) and 104.

Area III. Mathematics and Science — Select 6–12 units in upper-division courses from one or two of the following disciplines: biology, chemistry, geology, mathematics, geography (choose from 111, 112, 114, 117, 118, 120, 121, 127, 128, 132, 134) and physics.

HIGHLY RECOMMENDED: Biology 101 and 105.

Area IV. Social Science — Select 6–12 units in upper-division courses from one or two of the following disciplines: anthropology, African-American Studies, economics, geography (excluding 111, 112, 114, 117, 118, 120, 121, 127, 128, 132, 134), history, Chicano and Latin American Studies, political science, psychology and sociology.

HIGHLY RECOMMENDED: Psychology 101, 102 and Economics 165 (choose two). Bilingual students must take Chicano and Latin American Studies 116, 143 and 145.

V. Additional Major Electives (15 Units)

In addition to the 27-unit General Education BREADTH requirement, Liberal Studies majors are required to take an additional 15 units of upper- or lower-division coursework, usually selected from General Education BREADTH, Division 1–9. Substitutions are limited and subject to prior approval of the Liberal Studies adviser. The list that follows should be used in making selections:

Botany 10, Zoology 10; Geology 1; Physics 10; Physical Science 21; Geography 2 or 4 or 5 or 7; Art 179; Linguistics 134; Music 9 or 74; Chicano and Latin American Studies 9; Humanities 10 or 11; Philosophy 101, 103, 105, 115, 120, or 122; English 101, 102 or 103; any Division 8 (with the exception of Ag Ec 1) or 9.

VI. Liberal Studies Elective (34 Units)

Liberal Studies majors who plan to complete requirements for a Multiple Subject Credential (elementary teaching) normally take Professional Education Core courses as their electives. To enroll in the Professional Education Core courses it is essential that the candidate be officially admitted to the program one semester prior to enrolling in Core courses (April 1 for Fall enrollment in Core courses and November 1 for Spring enrollment in Core courses).

Admission to the teacher preparation (Multiple Subject) program requires that a student meet all admission requirements, which include passing the CBEST, maintaining a 2.89 GPA, and successfully completing T Ed 50, Introduction to Teaching (or equivalent).

Professional Education Core courses and course sequences recommended for the candidate and required for a Multiple Subject Credential include:

General Elem. Option I		Early Childhood Option II		Bilingual Emphasis	
1st semester		1st semester		1st semester	
T Ed 110	(3)	T Ed 110	(1)	T Ed 110	(3)
T Ed 130	(3)	T Ed 130	(3)	T Ed 130	(3)
T Ed 140	(3)	T Ed 140	(3)	T Ed 140	(3)
T Ed 150	(3)	T Ed 156M	(3)	T Ed 150	(3)
T Ed 156M	(3)			T Ed 156M	(3)
Subtotal	(15)	Subtotal	(10)	Subtotal	(15)
2nd semester		2nd semester		2nd semester	
T Ed 160	(12)	T Ed 148	(4)	T Ed 160	(12)
T Ed 121	(3)*	T Ed 110	(1)	T Ed 121	(3)*
		T Ed 110	(1)		
Subtotal	(15)	Subtotal	(6)	Subtotal	(15)
Total	(30)				
		3rd semester		3rd semester	
		T Ed 160	(12)	T Ed 138	(3)***
		T Ed 120CM	(2)**	T Ed 139	(3)***
				T Ed 141	(3)***
		Subtotal	(14)	Subtotal	(9)
		Total	(30)	Total	(39)

* May be taken prior to, concurrently with, or after final student teaching (T Ed 160).
** Must be taken concurrently with student teaching.
*** Required for a Bilingual/Cross-Cultural emphasis and must be taken in addition to the 30 units required in Option I.

Additional courses are required for a Clear Credential that may either be applied toward a bachelor's degree or toward a 5th year (30-unit postbaccalaureate program). These courses are listed below:

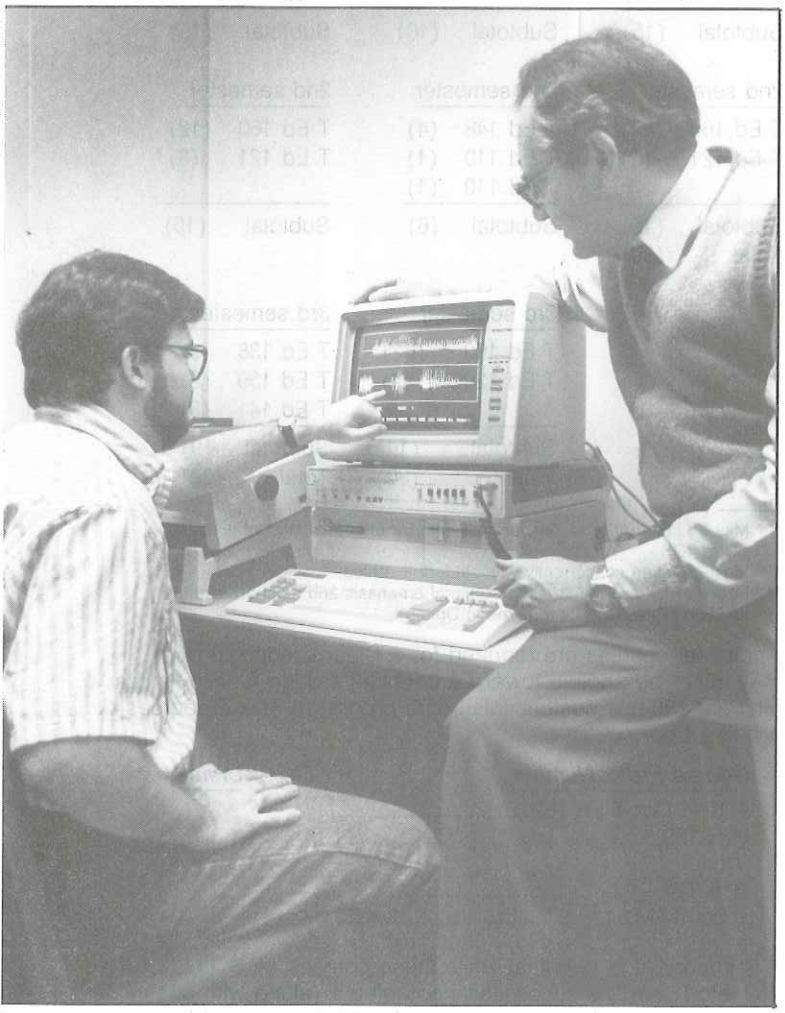
Course Prefix Number	*Units*
A S 111 or T Ed 162	2
H S 120	3
or	
H S 121	2
T Ed 134M	3

It is important to note that while these courses (A S 111, T Ed 162, etc.) must be successfully completed (along with all the other requirements) for a clear credential, they cannot be credited for a bachelor's degree and as part of a 5th year (30-unit) postbaccalaureate program. They must be applied to either a B.A. degree or to postbaccalaureate credit.

Linguistics

School of Arts and Humanities
Department of Linguistics
Jack B. Zeldis, Chair
Peters Business Building
(209) 278-2441

B.A. in Linguistics
Minor in Linguistics
M.A. in Linguistics



The Department of Linguistics offers an undergraduate minor, a Bachelor of Arts degree with options in English as a Second Language (ESL), and Spanish-English Bilingualism; and a Master of Arts degree with options in General Linguistics and ESL. In addition, Master of Arts degrees with emphasis in French or German are available.

Linguistics is the study of human language — its structure, its history and its function in human society. Linguists analyze the sounds of speech, they write grammars and dictionaries, they investigate the ways in which languages change across space and through time, and they study what it means to know a language, how languages are learned, and how an individual's language is related to the operation of his or her mind and to the values and expectations of the society to which he or she belongs.

An undergraduate major in linguistics qualifies a student to teach ESL in some foreign countries. It may also be used in conjunction with certain credential programs for elementary and secondary teaching careers in this country. Most students with undergraduate majors enter graduate programs either at CSU, Fresno or another university. A graduate degree qualifies a student to teach in a community college or university or in an adult school as well as in institutions in most foreign countries. A linguistics minor is a valuable supplement to a liberal studies major or to majors in psychology, anthropology, communicative disorders and other areas with a language component.

Facilities

The Department of Linguistics has equipment for the analysis of speech sounds and for displaying the operation of the organs of speech. Computers are used for simulating speech and for mapping the geographical extent of language features, as well as for storing the data needed for the making of grammars and dictionaries. To provide practical classroom experience for future teachers of ESL, the linguistics department is affiliated with the American English Institute, a school operated through the Extended Education Office to provide preuniversity instruction in English for foreign students. Interested students who meet the established criteria are selected to teach in the Institute. A description of the American English Institute is included in the *Special Programs* section of this catalog. The department's goal is to balance theory and practical application. Our graduates are not only well acquainted with linguistic theory but are also prepared to begin work as teachers or consultants and to continue advanced study of linguistic theory.

Career Opportunities

Most Linguistics graduates become teachers. There is a constant and increasing world-wide demand for teachers of ESL and for consultants and resource teachers in elementary and secondary schools, as well as for authors and editors of ESL instructional material. Linguists also work as teachers of other languages, as translators, as consultants to government and business, as bibliographers, as speech clinicians, and as specialists in any area where the ability to analyze human language is required.

Faculty

Jack B. Zeldis, *Chair*

Armando Baltra
Frederick H. Brengelman
Ellen Lipp
Peter A. Master
Gerald R. McMenamin
P. J. Mistry
Shigeko Okamoto
George W. Raney
Vida Samiian
Graham W. Thurgood
Raymond S. Weitzman
Grover K. H. Yu

Undergraduate Advisers: Gerald R. McMenamin and Frederick H. Brengelman
Graduate Adviser: Jack B. Zeldis

Bachelor of Arts Degree Requirements

Linguistics Major

To complete the major for the B.A. degree, students must complete 30 units in one of the patterns outlined below, the General Education requirement, special course requirements, and electives, totaling at least 124 units required for the B.A. degree.

The B.A. program in linguistics is diversified but integrated. It prepares the student for a variety of careers in such fields as bilingual-bicultural education and the teaching of ESL.

At present, two options are available to linguistics majors: 1) English as a Second Language, 2) Spanish-English Bilingualism. In each of these options the student receives a basic grounding in the nature and structure of human language.

1. Major requirements	*Units*
1A English as a Second Language	
a) Ling 10 or 135, 134 or 146, 141, 171	12
b) Select from: Ling 132, 138, 147	6
c) Approved electives (see Note 1)	12
	30
1B Spanish-English Bilingualism	
a) Ling 10 or 135, 134 or 146, 141	9
b) Select from Ling 132, 136, 147, 148	6–9
c) Electives from Chicano and Latin American Studies, Spanish, Linguistics	12–15
	30
2. General Education requirements	51
3. Electives and remaining degree requirements (See *Degree Requirements*); may be used toward a dual major or minor	43–46 *
	124

* This figure takes into consideration that Ling 10 may be applied to satisfy a linguistics major requirement as well as toward General Education, BREADTH, Division 7 (see *General Education*). Consult linguistics department chair or faculty adviser for details.

Notes:

1. Contact linguistics department chair or adviser for list of approved electives.
2. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy linguistics major requirements.
3. *CR/NC* grading is not permitted in the linguistics major.
4. General Education and elective units can be used toward a dual major or minor (see *Dual Major* or departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.

Linguistics Minor

A minor in linguistics consists of at least 21 units.

	Units
a) Ling 10 or 135, 134 or 146	6
b) Approved electives (See Note 1)	15
	21

General Education Credit

The following courses are applicable to Division 7 of the General Education requirements: Chinese 1A–B, 2A–B; Hebrew 1A–B; and Japanese 1A–B, 2A–B; Linguistics 10; Sanskrit 10A–B. See also the Foreign Language Department.

Language Development Specialist Certificate

See *Teacher Education, Specialist Credentials.*

Bilingual/Cross-Cultural Credentials

See *Education — Teacher Education Department, Bilingual/Cross-Cultural Specialist Credential* and *Bilingual/Cross-Cultural emphasis in Liberal Studies.*

Single Subject Waiver Program: English/English as a Second Language

Prerequisites:
Engl 41 or 43 (4)
Ling 10 or 135 (3)

Core Courses (Choose the required number of units from each group:	*Units* 35
Engl 182	(2)
Engl 189	(4)
Engl 193	(4)
Engl 164	(4)
Ling 141	(3)
Ling 138	(3)
Ling 134, 146	(3)
Engl 154, 155	(4)
Engl 146, 147, 150, 151, 152, 156	(4)
Engl 112, 113, 114, 115, 116, 146, 147, 150, 151, 152, 153, 154, 155, 156, 167, 168T, 169T, 183, 193, 194	(4)
Breadth Courses (Choose the required number of units from each group):	18
Ling 171	(3)
Ling 132, 136, 137	(6)
Ling 139, 142, 143, 145, 147, 148	(9)
Total	53

Graduate Program

Two options are available: one in General Linguistics, and one in English as a Second Language. For specific requirements, see description on next page; for general requirements see *Division of Graduate Studies and Research.* Students who are interested in the linguistic aspects of the French or German languages may select one of the formal emphases which are offered in cooperation with the Department of Foreign Languages.

The Master of Arts degree program in linguistics assumes a baccalaureate degree major in an appropriate field and at least three upper-division courses in linguistics as prerequisites. Graduate students are required to take a minimum of 15 units of graduate level courses (excluding Ling 290) and to pass a comprehensive examination.

(See also *Admission to Graduate Standing, Advancement to Candidacy, and Program Requirements.*)

Master of Arts Degree Requirements

	Units
Core Courses: Ling 145, 242, 243	9
General Linguistics option: Ling 148, 238 and 15 units of approved upper-division and graduate level course work	21
ESL option: Ling 237, 241, 244, and 12 units of approved upper-division or graduate level coursework of which a minimum of three units are in ESL-related areas	21
	30

Upon examination of the student's record other courses will be specified to produce a coherent program.

French and German Emphases

Students wishing master's degrees with concentrations in French or German may select the French or German emphases in the master's degree in linguistics. (See *Linguistics adviser.*) Graduate courses in French and German are available for use in these options. All have prerequisites of 24 upper-division units in the language or permission of the instructor.

Emphasis in French. Two courses from Fren 211, 212, 220T. Thesis topic should be in French linguistics. The GRE Advanced Test in French should be taken prior to advancement to candidacy.

Emphasis in German. Germ 220T, 240T. Thesis topic should be in German linguistics. The GRE Advanced Test in German should be taken prior to advancement to candidacy.

COURSES

Linguistics (Ling)

10. Introduction to Language (3). The nature and study of language. Human and animal language, languages of the world, sound and writing systems, systems of grammar, linguistic change, child language acquisition, role of language in society. General Education BREADTH, Division 7.

110. Indic Cultures and Traditions (3). (Same as Hum 150.) Study of the cultures and traditions of the Indian Subcontinent as part of the common human heritage, and for informed perspectives on international issues. Understanding of peoples of South Asia: their life styles, world views and experiences; the development of their intellectual, aesthetic and spiritual traditions; and their current aspirations and problems. General Education CAPSTONE Cluster.

132. Linguistics and Reading (3). Prerequisite: Ling 10 or 134. The linguistics background necessary for teaching reading in English. The English spelling system; the grammar and vocabulary of written English; preparation and evaluation of materials for teaching reading.

134. Structure of English (3). An introductory survey of the structure of English: sounds, spelling, word formation and grammar. Applications to language arts teaching and to the development of language skills.

135. General Linguistics (3). Human language and its characteristics. The nature and description of phonological, grammatical and semantic systems. Procedures for establishing language relationships and investigation of linguistic changes. Relationship between linguistics and allied areas.

136. Varieties of English (3). The regional, social and stylistic varieties of modern English. Emphasis on Black dialect and on the English of Mexican-Americans.

137. American English (3). Prerequisite: Ling 134 or 135. Studies in the linguistic structure of modern English.

138. History of the English Language (3). Study of the development of the sound system, grammar, vocabulary and writing system of English.

139. General Phonetics (3). Introduction to the phonetic properties of human languages; descriptive analysis of the speech sounds in a wide variety of languages; articulatory and acoustic aspects of speech; practice in production, perception and transcription of speech sounds. Introduction to experimental techniques.

140T. Topics in Linguistics (1–4; max total 12 if no topic repeated). Topics to be offered at the discretion of the department: historical, contrastive, mathematical and other areas of linguistics.

141. English as a Foreign Language (3). Theories, techniques and procedures in TESOL (Teaching English to Speakers of Other Languages); contrastive analysis of target and native language; the audio-lingual method; ESL (English as a Second Language) as a strand in bilingual education; cognitive vs. behavioristic view of language learning.

142. Phonology (3). Prerequisite: Ling 135. The sound patterns of human language. Phonemic theory and analytical techniques. Distinctive feature theory and analysis. Major phonological processes and their description.

143. Syntax (3). Prerequisite: Ling 135. Theory and practice in the description of grammatical systems. Comparison of approaches. Practical experience with data.

145. Historical Linguistics (3). Prerequisite: Ling 135. Explanation of similarities among languages; methods of reconstructing past languages and investigating relationship and grouping among languages. Inquiry about the nature and types of linguistic change and their correlation with changes in culture.

146. Practical English Grammar for Language Teachers (3). English grammar from the perspective of the language teacher. Format designed to be compatible with actual classroom needs of language arts and ESL teachers.

147. Bilingualism (3). An examination of psychological and sociological factors affecting individuals who attempt to function simultaneously in two different cultural environments, employing two separate linguistic codes. Review and comparison of past experience as well as current experimental programs in bilingual education.

148. Sociolinguistics (3). Methods of investigation and major findings in the study of the relationship between languages of the world and social class, race, age, sex and other social subcategories. Political and educational implications. Interaction between linguistic and social factors in linguistic variation.

171. Practicum in TESL (3). Prerequisite: Ling 141 or concurrent enrollment in Ling 141. Provides practice in teaching English as a Second Language; includes class visitations and classroom demonstrations; working with non-native speakers, lesson planning, material preparation, language lab work and evaluation of current ESL texts.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

Foreign Language Courses

Chinese (Chin)

1A–B. Elementary Chinese (3–3). Not open to students with previous training. Basic structure and pronunciation of Mandarin Chinese; practice in speaking, reading and writing. General Education BREADTH, Division 7.

2A–B. Intermediate Chinese (3–3). Prerequisite: Chin 1B. Review grammar and syntax; techniques of brush use; speaking and reading. General Education BREADTH, Division 7.

Hebrew (Hebr)

1A–B. Basic Hebrew (3–3). Basic structure and pronunciation of Hebrew; practice in reading, writing, speaking and grammar; suitable introduction to both Biblical and modern Hebrew. General Education BREADTH, Division 7.

Japanese (Japn)

1A–B. Elementary Japanese (3–3). Beginning course in modern spoken and written Japanese. Covers learning comprehension and oral practice, basic grammar and sentence patterns. Introduction to reading and writing in Kana and Kanji characters. General Education BREADTH, Division 7.

2A–B. Intermediate Japanese (3–3). Prerequisite: Japn 1B. Intermediate spoken and written Japanese; reading modern Japanese with emphasis on expository writings; translation and oral and written composition. General Education BREADTH, Division 7.

Sanskrit (Skt)

10A–B. Sanskrit (3–3). Introduction to the Sanskrit language and the Devanagari script. Core grammatical structure and vocabulary. Reading of Sanskrit texts. Literary tradition and life style of the speakers of the language, and relationship with Greek, Latin and Germanic languages. General Education BREADTH, Division 7.

English as a Foreign Language *(EFL)*

(See *Special Programs* section for English courses for speakers of other languages offered through the linguistics department.)

GRADUATE COURSES

(See *Course Numbering System.*)

231T. Seminar in Linguistics (3; max total 12 if no topic repeated). Prerequisite: Ling 135 and permission of instructor. Topics to be offered at the discretion of the department: philosophy of language, psycholinguistics, dialectology and other subjects in general linguistics.

232T. Seminar in English Linguistics (3; max total 12 if no topic repeated). Prerequisite: Ling 135 and permission of instructor. Topics to be offered at the discretion of the department: structure of Old, Middle or Early Modern English; topics in English phonology, grammar and lexicon.

237. Teaching Basic Written English (3). A description of the features of word formation, sentence structure, punctuation, vocabulary, and paragraph and essay structure basic to written English, with techniques for teaching.

238. History of Linguistics (3). Historical survey of scientific ideas, terms, techniques and theoretical positions in the study of language from ancient time to the present day, including traditional grammar, comparative philology and modern linguistics. Overview of general scholastic concern and climate during each period.

241. Seminar in Teaching English as a Second/Foreign Language (3). Prerequisite: Ling 141. Overview of research in the field of ESL/EFL teaching as reflected in current journal articles. Discussion and feedback dealing with points raised in assigned articles. Written reports summarizing ideas propounded in articles and expanded in class discussion.

242. Phonological Analysis (3). Prerequisite: Ling 142. The nature of phonological analysis, trends and issues in phonological theories, and phonological analysis of data from a variety of languages.

243. Syntactic Analysis (3). Prerequisite: Ling 143. The nature of syntactic analysis, trends and issues of syntactic theories, and syntactic analysis of data from a variety of languages.

244. ESL Classroom Evaluation Techniques (3). Covers classroom evaluation techniques from three perspectives: error analysis, contrastive analysis and testing. Current thinking on these topics will first be analyzed and discussed, and then applied to the actual classroom experience.

245. Seminar in Historical Linguistics (3). Prerequisite: Ling 145. Contribution of recent work on general linguistics, sociolinguistics and language acquisition studies to our understanding of diachronic grammar and its reconstruction. Other topics include the insights provided by language variation, language universals and typology, and discourse analysis.

249. Field Methods in Linguistics (3). Prerequisite: Ling 142 or equivalent. First-hand experience in eliciting linguistic data from informants; practice in analyzing and describing a language.

290. Independent Study (1–3; max see reference). *See Academic Placement — Independent Study.* Approved for *SP* grading.

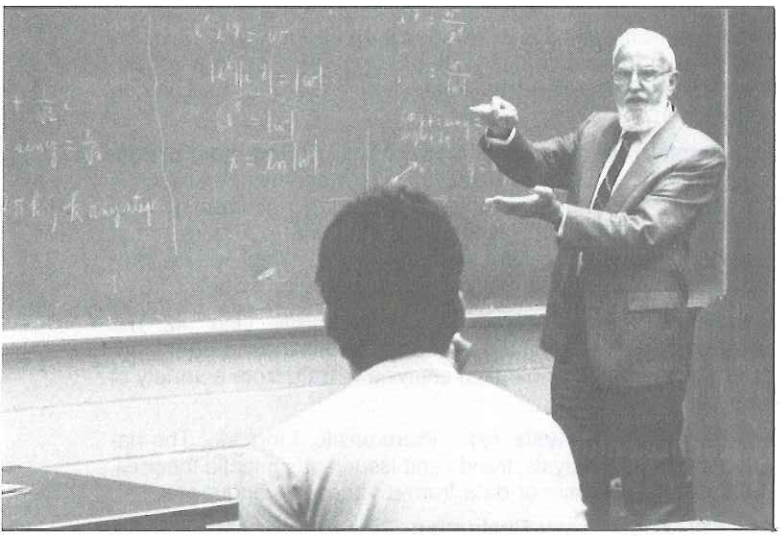
Mathematics

School of Natural Sciences
Department of Mathematics
Robert F. Arnold, Chair
Peters Business Building
(209) 278-2992

B.A. in Mathematics
Concentrations in:
- **Applied Mathematics**
- **Pre-College Teaching**
- **Pure Mathematics**
- **Statistics and Probability**

Minor in Mathematics
Credential Program Single Subject Waiver

M.A. in Mathematics
M.S. in Mathematics



Mathematics and related subjects play important dual roles in our culture. On the one hand mathematics is a study in its own right; on the other hand it is an indispensable tool for expressing and understanding ideas in the sciences, engineering and an increasing number of other fields. As a consequence, employment opportunities for mathematicians have been expanding in recent years. The courses offered by the department are designed to develop skills in and an appreciation and understanding of both roles.

Because there are so many different areas in which a trained mathematician can find employment or continue studies, the department has created four concentrations within the mathematics major. Within each concentration there is flexibility in choices to accommodate individual interests.

The concentration in *Applied Mathematics* prepares students to assume positions in technical industries or government employment, or to continue advanced studies in the applied area.

The concentration in *Pre-College Teaching* in mathematics provides students with the necessary background for obtaining a California Secondary Teaching Credential in mathematics. In order to complete the credential requirements, a fifth year of education courses, classroom observation and practice teaching is needed. At the present time there is an increasing demand for well-trained people in this area.

The concentration in *Pure Mathematics* prepares students for the pursuit of graduate studies leading to advanced degrees and employment at the college or university level, or research in industries.

The concentration in *Statistics and Probability* provides a good foundation for students planning to work as statisticians for industry or government agencies involving statistical analysis of scientific, technical or economic data. It also offers preparation for the first two examinations in the mathematics of insurance that are offered annually by the Society of Actuaries (this preparation includes Math 75, 76, 77, 107, 108). The offerings in applied topics as well as statistical computing are currently being expanded.

Faculty

Robert F. Arnold, *Chair*

Mir K. Ali
Moses E. Cohen
Larry W. Cusick
Donald J. Donohue
Della C. Duncan
Ernesto Franco-Sanchez
Noal C. Harbertson
Harold B. Haslam
Merrilee K. Helmers
Arthur A. Hiatt
Thomas C. Kipps
Anthony E. Labarre Jr.
Detlev Lindae
Hussain Sayid Nur
Hugo S. Sun
Peter Tannenbaum
Ronald L. Wagoner
Norman T. Woo
Burke Zane

Graduate Coordinator: M. Kursheed Ali
Undergraduate Advisers: All full-time faculty
Credential Adviser: Arthur A. Hiatt

Bachelor of Arts Degree Requirements
Mathematics Major

Requirement for entrance to the major and minor programs:

Completion of two years of algebra and courses in geometry and trigonometry, or a sequence of courses containing their equivalents, such as Math 1R, 2R, 4R, 5.

It is strongly recommended that such study be completed before entrance to the university.

Total Course Requirements for the Bachelor's Degree: 124 units. See *Baccalaureate Degree Requirements* for complete details on general degree requirements. A minimum of 40 units, including those required for the major, must be upper division.

	Units
A. Major requirements	46–51
Concentrations (select one):	
Applied Mathematics	
Pre-college Teaching	
Pure Mathematics	
Statistics and Probability	
B. General Education requirements	51
C. Electives (which may include a minor)	22–30*
Total	124

* This figure takes into account that 3 units of Math 75 may also be applied to satisfy the General Education CORE mathematics requirement if intermediate algebra was completed in high school (see *General Education*). Consult department chair or faculty adviser for details.

Major Concentration Requirements

Pure Mathematics Concentration

	Units
Core — Math 75, 76, 77, 81	16
C Sci 20 or 40	4
Math 151, 152	8
Math 171, 172	8
Math 107, 114, 123, 131, 181, 182 (select one)	3
Math 161, 165, 168 (select one)	3
Math 110, 111, 116, 118, 128, 191T (select two)	6–7
Total	48–49

Applied Mathematics Concentration

	Units
Core — Math 75, 76, 77, 81	16
C Sci 20 or 40	4
Math 128, 181, 182 (Select two)	6
Math 101 or 109, 107, 108, 131, 132 (select two)	6–7
Math 114, 118, 121, 122, 123, 165, 191T (select one)	3
Math 124 or 152, 151, 171	11–12
Total	46–48

Pre-college Teaching Concentration

Core — Math 75, 76, 77, 81	16
C Sci 20 or 40	4
Math 101 or 107, 116, 143	11–12
Math 151, 161, 171	11
Math 124 or 152	3–4
Math 110, 111, 114, 128, 131, 145, 172, (select one)	3–4
Total	48–51

Statistics and Probability Concentration

Core — Math 75, 76, 77, 81	16
C Sci 20 or 40	4
Math 101	4
Math 107, 108, 109	9
Math 151, 171	8
Math 124 or 152	3–4
Math 118, 121, 128, 172 (select one)	3–4
Total	47–49

Mathematics Minor

The requirements for a minor in mathematics consist of the following:

	Units
a) Math 70, or Math 71 and 72, or Math 75	4–6
b) Upper-division Math courses	6
c) Electives in Mathematics	10–8
	20

Math 1R, 2R, 4R may not be included in the minor.

Advising Requirements

Mandatory advising at least once a semester is required of all majors in the degree programs. See the department chair for assignment to an adviser.

Grade Requirements

All courses taken to fulfill major course requirements must be taken for a letter grade. All courses required as prerequisites for a course must be completed with a grade of *C* or better before registration will be permitted.

Duplication of Courses

No credit will be allowed for:	If taken after completion of:
Math 5	Math 72 or 75
Math 6	Math 71 or 75
Math 70	Math 72 or 75
Math 75	Math 76
Math 76	Math 77
Math 77	Math 81

Graduate Program

Requirement for Entrance to the Graduate Program: Completion of undergraduate preparation equivalent to a CSU, Fresno major in mathematics. (See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Project.)*

Master of Arts and Master of Science Degree Requirements

The Master of Arts and the Master of Science degree programs in Mathematics are designed to provide preparation for work in industry, for high school and community college teaching, and for advanced graduate study in mathematics. Those who plan to work in industry or teach at a high school or community college will ordinarily take the Master of Science. Those planning on pursuing a Ph.D. in Mathematics, or a related field, will take the Master of Arts.

Language Requirement: There is no foreign language requirement for the master's degree. However, any student preparing for graduate work in mathematics is advised to meet the foreign language requirements of the university in which the graduate work will be taken, since most graduate programs do not leave time for language study. Such preparation normally involves at least two of the languages: French, German, Russian.

Under the direction of an advisory committee, each candidate prepares and submits for approval a coherent program individually designed within the following framework:

	Units
At least 15 units of mathematics in the 200 series, including Math 298.	15
Electives from upper-division or graduate level, including at least 9 units of mathematics.	15
Total	30

Master of Science degree candidates must complete Math 152, 172 and 181 or their equivalents in their graduate program if they have not completed them in their undergraduate program. Master of Arts degree candidates must complete Math 251, 271, either Math 252 or 272, and either Math 263 or 265.

The Math 298 research project culminates in a written and oral report to the Department of Mathematics.

COURSES

Mathematics (Math)

ILR. ELM Basic Mathematics Skills. (3–6 units). Prepares students for the ELM exam and for Math 4. The course takes two semesters and reviews arithmetic, elementary algebra and

geometry. Note: Enrollment is limited to freshmen who score lower than 350 on the ELM exam. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

AR. ELM Basic Mathematics Skills. (3 units). Develops problem solving skills in arithmetic (integers and rational numbers), elementary algebra (exponents, roots, polynomials and rational expressions, linear and quadratic equations, and graphing) and geometry (perimeters, areas, volumes, triangle properties, parallelism and perpendicularity). *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

1R. Elementary Algebra (3). Fundamental operations, linear equations, polynomials, factoring, rational expressions, graphing of linear equations, introduction to inequalities, quadratic equations, and systems of linear equations. *CR/NC* grading only; not applicable toward baccalaureate degree requirements. (See *Duplication of Courses.*)

1AR. Elementary Algebra Laboratory (1). Prerequisite: concurrently enrolled in Math 1 and assigned to laboratory after taking placement examination. Laboratory does not count toward baccalaureate degree. Extra review and practice with skills essential to success in elementary algebra. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

2R. Elementary Geometry (3). Prerequisite: elementary algebra. Postulates concerning points, lines, planes. Definitions. Congruence; properties of triangles. Parallel lines. Properties of quadrilaterals. Area formulae. Similar figures. Circles. Volumes of certain solids. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

4R. Intermediate Algebra (3). Prerequisite: elementary algebra and geometry. Radicals, rational exponents, quadratic equations, simultaneous linear equations, graphing, inequalities, complex numbers in rectangular form, introduction to exponential and logarithmic functions, applications. *CR/NC* grading only; not applicable toward baccalaureate degree requirements. (See *Duplication of Courses.*)

4AR. Intermediate Algebra Laboratory (1). Prerequisite: concurrently enrolled in Math 4R and assigned to laboratory after taking placement examination. Laboratory does not count toward baccalaureate degree. Extra review and practice with skills essential to success in intermediate algebra. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

5. Trigonometry (3). Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam and intermediate algebra. Concept of a function, sine and cosine functions, tables and graphs, other trigonometric functions, identities and equations. Trigonometric functions of angles, solution of triangles. (See *Duplication of Courses.*) (CAN MATH 8)

6. Precalculus (4). Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam and two years high school algebra, or Math 4R, or permission of instructor. Basic algebraic properties of real numbers; linear and quadratic equations and inequalities; functions and graphs; polynomials; exponential and logarithmic functions; analytic trigonometry and functions; conics; sequences, and series.

11. Elementary Statistics (3). Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam and intermediate algebra. Illustration of statistical concepts: elementary probability models, sampling, descriptive measures, confidence intervals, testing hypotheses, chi-square, nonparametric methods, regression. It is recommended that students with credit in Math 72 or 75 take Math 101. General Education CORE, Quantitative Reasoning. (CAN STAT 2)

14. Introduction to Discrete Mathematics (3). Prerequisite: passing score on the Elementary Level Mathematics (ELM) Exam and intermediate algebra. Set theory, relations and functions, logic, proof techniques, number systems.

41. Number Systems (3). Not open to mathematics majors. Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam, intermediate algebra and geometry; designed for elementary credential candidates. Development of rational number system and its subsystems from the informal point of view; sets, relations and operations, equivalence classes; definitions of number systems and operations; algorithms for operations; prime numbers, divisibility tests; ratios.

43. Elementary Problem Solving (3). Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam and intermediate algebra. The purpose of this course is to develop problem solving skills using elementary mathematics.

45. What is Mathematics? (3). Prerequisite: passing score on the ELM Exam and intermediate algebra. Intended primarily for liberal arts students. Topics: mathematics and social science, mathematics of shape and growth, statistics, mathematics of management science and mathematics of computers. General Education CORE, Quantitative Reasoning.

52. Elementary Linear Algebra (3). Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam and intermediate algebra. Elementary properties of matrices, determinants; systems of linear equations; linear transformations.

70. Mathematics For Life Sciences (4). No credit if taken after Math 72 or 75; one unit of credit if taken after Math 71. Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam and intermediate algebra. Functions and graphs, limits, derivatives, antiderivatives, differential equations, and partial derivatives with applications in the Life Sciences. General Education CORE, Quantitative Reasoning.

71. Elementary Mathematical Analysis 1 (3). No credit if taken after Math 70, 72, or 75. Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam, elementary geometry and intermediate algebra. Review of algebra, real numbers, inequalities, function, graph, finite induction, limit, differentiation of algebraic functions and applications to extrema, mean value theorem, l'Hôpital's rule.

72. Elementary Mathematical Analysis 2 (3). No credit if taken after Math 75; two units of credit if taken after Math 70. Prerequisite: Math 71 and trigonometry. Analytic geometry and calculus of polynomials, rational functions, transcendental functions; polar coordinates, conic sections, integration and applications. General Education CORE, Quantitative Reasoning.

75. Mathematical Analysis I (4). No credit if taken after Math 72; two units of credit if taken after Math 71; 3 units of credit if taken after Math 70. Prerequisite: passing score on the Entry Level Mathematics (ELM) Exam, elementary geometry, intermediate algebra, trigonometry, or Math 6. Inequalities, functions, graphs; limits, differentiation of algebraic functions, the definite integral and applications. General Education CORE, Quantitative Reasoning. (CAN MATH 18)

76. Mathematical Analysis II (4). Prerequisite: Math 72 or 75. Transcendental functions, techniques of integration, improper integrals, arc length; conic sections; polar coordinates; introduction to vectors. (CAN MATH 20)

77. Mathematical Analysis III (4). Prerequisite: Math 76. Three dimensional calculus; partial derivatives; multiple integrals; infinite series, and applications. (CAN MATH 22)

81. Applied Analysis (4). Prerequisite: Math 77. Introduction to ordinary linear differential equations; solutions by power series and Laplace transforms. Vector analysis; line, surface, and volume integrals. Solution of systems of linear equations by matrix methods. Introduction to Fourier series. Introduction to complex variables.

90. Directed Study (1–3; max total 3). Independently arranged course of study in some limited area of mathematics either to remove a deficiency or to investigate in more depth (1–3 hours, to be arranged).

101. Statistical Methods (4). Prerequisite: Math 70, 71, or equivalent. Application of statistical procedures to examples from biology, engineering, and social science; one- and two-sample normal theory methods; chi-square, analysis of variance, and regression; nonparametric methods. Computerized statistical packages are used.

107. Introduction to Probability and Statistics (3). Prerequisite: Math 77 (or concurrently). Basic concepts required for applications of probability theory; standard discrete and continuous models; random variables; conditional distributions; limit theorems.

108. Statistics (3). Prerequisite: Math 107. Criteria used for selecting particular procedures of data analysis; derivation of commonly used procedures; topics from sampling, normal theory, nonparametrics, elementary decision theory.

109. Applied Probability (3). Prerequisite: Math 107. Introduction to stochastic processes and their applications in science and industry. Markov chains, queues, stationary time series.

110. Symbolic Logic (3). (Similar to Phil 145; consult department.) Prerequisite: Math 71 or 75. An informal treatment of the theory of logical inference, statement calculus, truth-tables, predicate calculus, interpretations applications.

111. Theory of Sets (3). Prerequisite: Math 71 or 75. Set theory from an informal axiomatic foundation, relations and functions, cardinal numbers, ordinal numbers, applications.

114. Discrete Structures (3). Prerequisite: Math 76. Counting techniques, matrix algebra, graphs, trees and networks, recurrence relations and generating functions, applied modern algebra.

116. Theory of Numbers (4). Prerequisite: Math 72 or 75. Divisibility theory in the integers, primes and their distribution, congruence theory, Diophantine equations, number theoretic functions, primitive roots, indices, the quadratic reciprocity law.

118. Graph Theory (3). Prerequisite: Math 77. Trees, connectivity, Euler and Hamilton paths, matchings, chromatic problems, planar graphs, independence, directed graphs, networks.

121. Numerical Analysis I (3). Prerequisite: Math 77 and working knowledge of C, Fortran, or Pascal. Zeros of non-linear equations, interpolation, quadrature, systems of equations, numerical ordinary differential equations, and eigenvalues. Use of numerical software libraries.

122. Numerical Analysis II (3). Prerequisite: Math 121. Advanced topics from numerical linear algebra, function approximation, fast Fourier transforms, and numerical partial differential equations. Use of numerical software libraries.

123. Topics in Applied Mathematics (3). Prerequisite: Math 77. Vector spaces and linear transformations, eigen values and eigen functions. Special types of linear and nonlinear differential equations; solution by series. Fourier transforms. Special functions, including gamma, hypergeometric, Legendre, Bessel, Laguerre and Hermite functions. Introduction to partial differential equations.

124. Applied Matrix Analysis (3). Prerequisite: Math 77. Matrix algebra, systems of equations, eigenvalues, eigenvectors, diagonalizations, functions of matrices with applications to differential equations, optimization, and Markov chains.

128. Complex Analysis (3). Prerequisite: Math 77. Analytic functions of a complex variable, contour integration, series, singularities of analytic functions, the residue theorems, conformal mappings; applications to engineering and physics.

131. Game Theory and Linear Programming (3). Prerequisite: Math 72 and permission of instructor; or Math 76. Introduction to linear programming, problem formulation, adaptation of the Dantzig simplex algorithm to linear programming problems, duality theory, transportation problems. Games of chance, strategy, minimax theorem for two-person zero-sum games, relationship to linear programming.

132. Mathematical Methods of Operations Research (3). Prerequisite: Math 131 or permission of instructor. Simplex method, parametric programming, goal programming, dynamic programming, integer programming, non-linear programming, and network models, with applications.

136. Coding Theory (3). Prerequisite: Math 114. Mathematical Properties of error correcting codes; information rate, error detecting and error correcting capacities, encoding and decoding algorithms. Linear, cyclic, Hamming, BCH and Golay codes.

140. Applications of Calculus (4). Prerequisite: intermediate algebra. This course is designed to give liberal arts students the crucial ideas of calculus in an informal way. Applications in biology, medicine, business, economics, psychology, engineering, and athletics will be stressed. Open to all credential candidates except math majors.

142. General Mathematics (4). Prerequisite: intermediate algebra, Math 140. The role of arithmetic, algebra, and geometry in the development of modern mathematics will be studied, as well as an informal treatment of rational number system. Introduction to the nature of mathematics for students in arts, humanities, and social sciences. Open to all credential candidates except math majors.

143. History of Mathematics (4). Prerequisite: Math 72 or 75. History of the development of mathematical concepts in algebra, geometry, number theory, analytical geometry, and calculus from ancient times through modern times. Theorems with historical significance will be studied as they relate to the development of modern mathematics.

145. Problem Solving (3). Prerequisite: at least one mathematics course in the 100–200 series. A study of formulation of problems into mathematical form; analysis of methods of attack such as specialization, generalization, analogy, induction, recursion, etc. applied to a variety of non-routine problems. Topics will be handled through student presentation.

151. Principles of Algebra (4). Prerequisite: Math 76. Equivalence relations; groups, cyclic groups, normal subgroups, and factor groups; rings, ideals, and factor rings; integral domains and polynomial rings; fields and field extensions.

152. Linear Algebra (4). Prerequisite: Math 151. Vector spaces, linear transformations, matrices, determinants, eigenvalues and eigenvectors, linear functions, inner-product spaces, bilinear forms, quadratic forms, orthogonal and unitary transformations, selected applications.

161. Principles of Geometry (3). Prerequisite: Math 72 or 75. The classical elliptic, parabolic, and hyperbolic geometries developed on a framework of incidence, order and separation, congruence; coordinatization. Theory of parallels for parabolic and hyperbolic geometries. Selected topics of modern Euclidean geometry.

165. Differential Geometry (3). Prerequisite: Math 77. Study of geometry in Euclidean space by means of calculus, including theory of curves and surfaces, curvature, theory of surfaces, and intrinsic geometry on a surface.

168. Geometric Topology (3). Prerequisite: Math 77. Topology of surfaces, the Euler characteristic, homeomorphism, the fundamental group, vector fields on surfaces, knot theory and introduction to differentiable manifolds.

171. Intermediate Mathematical Analysis I (4). Prerequisite: Math 77. Sets, real numbers as a complete ordered field, its usual topology, functions of a real variable, limits, continuity, uniform continuity, differentiability, generalized mean value theorem, Riemann integrals, series of functions, uniform convergence, and Fourier series of integrable functions.

172. Intermediate Mathematical Analysis II (4). Prerequisite: Math 171. Differentiation of functions of several variables, applications of partial differentiation, functions of bounded variation, rectifiable curves, theory of Riemann-Stieltjes integration, multiple integrals and line integrals, improper Reimann-Stieltjes integrals. Inverse and Implicit function theorems.

181. Differential Equations (3). Prerequisite or concurrently: Math 81 or 123. Definition and classification of differential equations; general, particular, and singular solutions; existence theorems; theory and technique of solving certain differential equations; phase plane analysis, elementary stability theory; applications.

182. Partial Differential Equations (3). Prerequisite: Math 81 or 123, and 171. Classical methods for solving partial differential equations including separation of variables, Green's functions, the Riemann-Volterra method and Cauchy's problem for elliptic, parabolic, and hyperbolic equations; applications to theoretical physics.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

191T. Proseminar (1–3; max total 9). Prerequisite: permission of instructor. Presentation of advanced topics in mathematics in the field of the student's interest.

GRADUATE COURSES

(See *Course Numbering System.*)

202. Fundamental Concepts of Mathematics (3). Prerequisite: Math 151, 161 and 171. Fundamental notions regarding number theory, number systems, algebra of number fields; functions.

210. Foundations of Mathematics (3). Prerequisite: Math 110 or 151. Formal introduction to theories of inference, first order theories, completeness metatheorems, consistency metatheorems, decision problems.

216. Topics in Number Theory (3; max total 6). Prerequisite: Math 116. An investigation of topics having either historical or current research interest in the field of number theory.

221. Advanced Numerical Analysis (3). Prerequisite: Math 121, Linear equations and matrices; parabolic, hyperbolic, and elliptic differential equations; constructive function theory.

223. Principles and Techniques of Applied Mathematics (3). Prerequisite: Math 123. Linear spaces and spectral theory of operators.

224. Optimization Methods (3). Prerequisite: Math 123. Techniques for optimizing static and dynamic systems, calculus of variations, Hamiltonian canonical form, maximum principle, with applications.

228. Functions of a Complex Variable (3). Prerequisite: Math 128, 171. Representation theorems of Weierstrass and Mittag-Leffler, normal families, conformal mapping and Riemann mapping theorem, analytic continuation, Dirichlet problem.

251. Abstract Algebra I (3). Prerequisite: undergraduate abstract algebra. Groups, rings, integral domains, and fields.

252. Abstract Algebra II (3). Prerequisite: Math 251. Rings and ideals, modules, linear and multi-linear algebras, representations.

263. Point Set Topology (3). Prerequisite: Math 172. Basic concepts of point set topology, set theory, topological spaces, continuous functions; connectivity, compactness and separation properties of spaces. Topics selected from function spaces, metrization, dimension theory.

265. Differential Geometry (3). Prerequisite: Math 165, 172. Study of geometry of curves and surfaces in Euclidean space; including an introduction to Riemannian geometry and theory of manifolds.

271. Real Variables (3). Prerequisite or concurrently: Math 172. Theory of sets; cardinals; ordinals; function spaces, linear spaces; measure theory; modern theory of integration and differentiation.

272. Functional Analysis (3). Prerequisite: Math 271. The Lebesgue-Stieltjes integral and its generalizations, integral equations, Hilbert and Banach spaces, linear transformations (bounded and unbounded).

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

291. Seminar (3). Prerequisite: graduate standing. Presentation of current mathematical research in field of student's interest.

298. Research Project in Mathematics (3). Prerequisite: graduate standing. Independent investigation of advanced character as the culminating requirement for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

302. Topics in Mathematics for Teachers (3; max total 6, if topic not repeated). Prerequisite: permission of instructor. Topics in modern mathematics with special emphasis for teachers.

Military Science

School of Business and Administrative Sciences
Department of Military Science
LTC William F. Hausman Jr., Chair
North Gym, Room 211
(209) 278-2887, 278-4810
In California, 1 (800) 255-ROTC

Army Reserve Officer's Training Corps Program (ROTC)

Minor in Military Science

We are a program that develops the mental and physical qualifications of students in preparation for positions of leadership within the military and civilian communities. Our instruction is challenging, professional, and enjoyable, and it complements all major areas of study. The course of study offered in Military Science is designed not only to prepare the student for service as a commissioned officer in the United States Army but also to provide him/her with knowledge and practical experience in leadership and management that will be useful in any facet of society.

Students who are uncertain about what the Army is all about and what it can offer may enroll in introductory courses for either one or two units. These courses acquaint the student with how the Army fits into society and some of the exciting things officers do. They also show how the Army can fit into a student's long and short range individual goals.

Those students who desire to pursue an opportunity for a military career can enroll in a structured curriculum from 12–21 units over a period of two years (see class listings next page). One of the significant and exciting aspects of this curriculum is the requirement for a student to attend a six-week summer camp — with pay — following the first year of the structured curriculum. This camp enhances the student's ability to lead by providing him/her with actual experience in leading other students who represent some 69 colleges and universities in 18 states.

Additionally, the student's curriculum must include acquired knowledge in written communication skills, understanding of human behavior, military history, computer literacy and math reasoning.

Career Opportunities

Upon completion of the ROTC requirement you are commissioned a second lieutenant in the United States Army. You may be selected to go on active duty if you desire. It should be noted that the recruiters for major corporations actively seek out former military officers to fill management positions because of the great personal motivation, discipline and maturity which are hallmarks of the military officer. If you desire you may request a Guaranteed Reserve Forces Duty contract. This contract specifically states that you will receive a Reserve or National Guard assignment after completion of your ROTC requirements. Thus you may pursue your civilian career and still be an officer in the U.S. Army.

Enrollment Requirements

Those students who are simply interested in finding out about our program should enroll in one of our introductory courses (see class listings next page). Those who are considering pursuing the full ROTC course must meet certain requirements. Information on these requirements can be obtained by telephoning or visiting the Army ROTC office on campus (278-2887/4810) or in California, 1 (800) 255-ROTC.

Financial Assistance

All students formally enrolled in the ROTC program receive at least $1,000 a year and can earn as much as $10,000 during their college careers. Each student receives $100 (tax free) each month of the school year and about $750 for summer camp. Students may also join a United States Army Reserve or California Army National Guard Unit as an officer trainee and be paid an additional $120 per month. The Army also has made available two, three, and four year scholarships — on a competitive basis — which pay all tuition, books and fees in addition to the $100 (tax free) each month.



Extracurricular Activities

Several formal and informal activities are available. For example, weekly leadership laboratories — one hour each week — are conducted along with one weekend field trip each semester. These field trips include such activities as helicopter insertions, map reading, rappelling, and work on various army individual confidence building devices. Apart from formal military activities, Army ROTC provides an atmosphere where friends pursuing a common career can get together for things such as parties, a formal ball, intramural sports, and participation in special clubs such as a rifle/pistol shooting club, a military tactics organization and a rappelling club.

Faculty

LTC William F. Hausman Jr., *Chair*

Paul K. Gonzales
Bradford M. Jones
Joseph M. Picanco
Joan S. Sisco
Thomas L. Wing

Advisers:

Paul K. Gonzales
Bradford M. Jones
Joan S. Sisco
Thomas L. Wing

The faculty of the Department of Military Science are highly qualified and experienced professional army officers, who are selected for their instructor qualifications and academic background. Each officer is a graduate of at least two required Army schools in their respective fields in addition to an advanced course program. Students find departmental faculty helpful in guiding them through their academic experience as well as helping them pursue career goals.

Military Science Minor

Each student enrolled in the ROTC Advanced Course and who completes the 18 units (16 upper-division) necessary for commissioning will be eligible for the award of a minor in military science. Coordination with the department faculty adviser is required.

	Units
Required courses are MS 131, 132, 134; PE AC 42	12
Elect 2 of 3 courses from MS 141, 192, or Hist 180	6
Total	18

COURSES

Military Science (MS)

1. Introduction to Military Science (1). Organization and functions of the U.S. Defense Establishment; roles of the military departments; role of ROTC in providing the military with officer leadership.

2. Survival Training (1). Survival techniques in a field environment; major emphasis on plant and animal foods, first aid procedures, mountaineering, field crafts, and survival swimming. The course includes five 3-hour field trips.

3. U.S. Army in Vietnam (1). Overview of U.S. Army involvement in Vietnam. Background highlighted with such subjects as pacification, Khe Sanh, draft evasion and My Lai incident. Study the effect of technology (with emphasis on army aviation) on command and control techniques.

11. General Military Skills (2). Basic rope work to include knots and rappelling, basics of orienteering and land navigation, basic marksmanship and military briefings.

12. Basic Leadership and Management (2). Principles of leadership; principles of resource management; group goal attainment focusing on leader, group, and situational needs.

13. ROTC Basic Camp (3). Prerequisite: permission of instructor. A 6-week summer camp conducted at Fort Knox, Kentucky, designed for students interested in earning a commission, but who were unable to complete the ROTC Basic Course at CSUF. Topics include: basic military skills and leadership principles.

131. Advanced Leadership and Management (3). Prerequisite: permission of instructor. Personnel management problems and techniques of motivation as applied to a military environment; techniques and methods of instruction; application of basic military skills; military law.

132. Small Unit Leadership (3). Prerequisite: MS 131 or permission of instructor. Principles of tactics and operations; organization of small units and their employment; field orders and instructions; small unit leadership techniques.

133. ROTC Advanced Camp (3). Prerequisite: permission of instructor. A 6-week summer camp conducted at Fort Lewis, Washington. Topics include: familiarization with U.S. Army weapons systems, military skills, confidence training, light Infantry tactics and leadership and management techniques.

134. Leadership Laboratory (1; max total 4). Practical work to augment classroom instruction. Weekly morning laboratories plus one field trip each semester. Attendance at all functions is voluntary, but lack of participation will adversely affect grades. Must be taken each semester a student is enrolled in Advanced Course.

141. Ethics and Military Professionalism (3). Prerequisite: permission of instructor. Military Professional Ethics, Military Justice, Command and Staff Functions, Mission and Organization of the U.S. Army and Military Correspondence.

192. Directed Reading in Selected Military Topics (3). Prerequisite: completion of MS 131, MS 132, MS 141 and Hist 180. Directed reading in Military History and/or the role of the army in the formulation of national policy in consultation with a faculty adviser. The course requires a substantial writing requirement.

MUSIC

School of Arts and Humanities
Department of Music
Jack R. Fortner, Acting Chair
Music Building, Room 102
(209) 278-2654

B.A. in Music
Minor in Music
M.A. in Music
Single Subject Teaching Credential

A major in music very often prepares students to enter careers in teaching and performance. It always enhances their knowledge of the musical art and increases their sensitivity to the musical world around them.

The Department of Music provides (a) undergraduate instruction in music for those planning professional careers as performers, composers and studio teachers, as well as those preparing for advanced degrees in performance, composition, and musicology; (b) preparation for the teaching credential programs in or involving music; (c) graduate training for students planning professional and academic careers or seeking professional growth as teachers in junior colleges or other school systems; (d) broad acquaintance with musical art for the layman and nonmusic major. Two degree programs accredited by the National Association of Schools of Music are offered: the Bachelor of Arts and the Master of Arts, each with concentrations in performance, composition, music history or music education. A Bachelor of Arts degree with a concentration in Studio Piano Teaching is also offered.

Faculty and Facilities

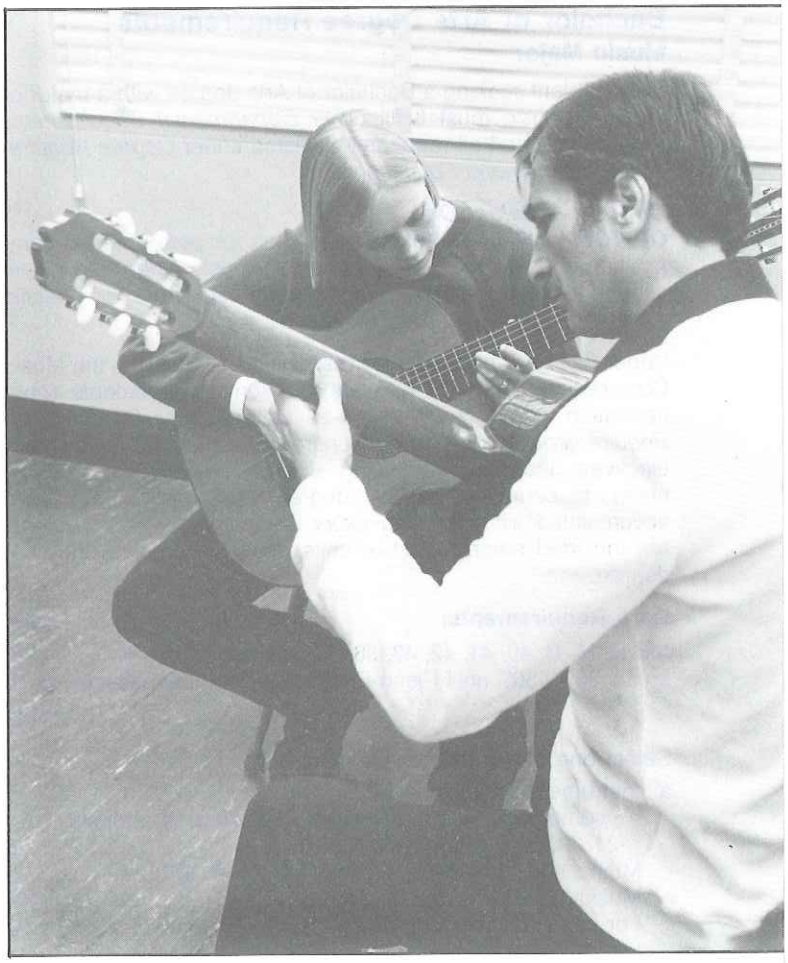
The Department of Music faculty is composed of individuals whose backgrounds reflect varied areas of specialization: performance, composition, scholarly research and music education. Many members of the faculty have national and international reputations as performing artists and teachers. Others are well known for their articles and books. They are *all* dedicated to the task of providing the best music education possible for students in their classes and studios.

The Music Building consists of faculty studios, offices, classrooms, practice rooms, rehearsal halls, and a recital hall. Special facilities include an electronic studio and a computer assisted instruction laboratory.

Career Opportunities

While many graduates have made successful performing careers in opera, orchestras and popular music ensembles, the majority have established careers as private or public school teachers. Those who complete graduate studies have either advanced in public school careers or have made careers as teachers in higher education.

There are also other types of careers open for music majors and minors in music-related areas. The music industry draws on persons with musical backgrounds for their sales representatives and instrument technicians. Churches employ organists and choir directors, many on a full-time basis. The field of recreation also offers employment to persons with some expertise in music.



Faculty

Jack R. Fortner, *Acting Chair*

M. Teresa Beaman
Angela Myles Beeching
Kathryn Bumpass
W. Ritchie Clendenin
Jose A. Diaz
Steven E. Gilbert
Thomas N. Hiebert
Phyllis A. Irwin
Robert F. Judd
Phillip M. Lorenz
David R. Margetts
Steven E. Schick
Juan Serrano
Lawrence R. Sutherland
Gary L. Unruh

Bachelor of Arts Degree Requirements
Music Major

Each student seeking a Bachelor of Arts degree with a major or minor in music must fulfill *Other Departmental Requirements* (see below) and all requirements listed under *Degree Requirements and General Education.*

Options — Select One:

OPTION I (47–64 units): Preparation for performance, composition, music history, and careers in music other than public school teaching. Consult departmental advisers for specific assistance in your area(s) of interest.

Under Option I, the student is responsible for fulfilling the Music Core requirements (33–43 units); Option I requirements (concentration a, b, c or d — 14–20 units); *Other Departmental Requirements* (see below); General Education (51 units); and electives, including remaining degree requirements (10–26 units), to complete the B.A. degree (124 units). **Note:** units accumulated while fulfilling *Other Departmental Requirements* are included among elective units used to complete the B.A. degree.

Core Requirements *Units*

Music 1A–B, 40, 41, 42, 43, 58, 61, 141, 144, 161A–B–C.....33
Music 36S–136S until Piano Proficiency Exam is passed....0–10
33–43

Select one of the following emphases:

a. Instrumental Performance
4 semesters with advanced standing in Music 31S–131S through 38S–138S.....8
Music 140T, 142, 148, 150A–B–C–D, 160T, 171.....5
Music 198.....1–2
For keyboard majors: Music 119P.....2
Music 176T.....3
14–20

b. Vocal Performance
4 semesters with advanced standing in Music 39S–139S.....8
Music 119Q (Vocal Pedagogy).....2
Music 172 (Vocal Literature).....2
Music 185A (Vocal Diction I).....2
Music 185B (Vocal Diction II).....2
Music 158B (Advanced Choral Conducting).....2
Music 198 (Senior Recital).....2
20

c. Composition
9 units in Music 48.....9
6 units in Music 148 with advanced standing in composition.....6
1 unit in Music 199.....1
2 semesters in piano (Music 36S–136S) after passing Piano Jury Examination, Level 1.....4
20

d. Music History
Music 142.....3
Music 160T.....6
Music 171.....3
Music 190.....2–3
Music 198, 199.....1–2
15–17

OPTION II (72–86 units): Waiver program for Single Subject Credential preparing students to teach music in grades K–12.

Under Option II, the student is responsible for fulfilling core requirements (54–64 units); ensemble requirements (18–22 units); and General Education (51 units); and electives to complete the B.A. degree (124–137 units). Additional Credential Requirements (10 units) may be completed before or after completion of the B.A. degree.

Consult the departmental credential adviser and the School of Education and Human Development for information regarding the 30 units of professional education necessary for completion of Single Subject Credential and 5th year requirements.

Core Requirements *Units*

Music 1A–B, 40, 41, 42, 43, 58, 61, 119I, J, K, L, M, N, O, Q, 144, 158A or 158B, 161A–B–C.....42
Music 36S–136S until Piano Proficiency Exam is passed....0–10
Elect from Music 182, 183, 184.....3
4 Semesters in Music 31S–131S through 39S–139S, including 2 semesters with Advanced Standing.....8
Music 198 or 199.....1
54–64

Select one of the following emphases:

Voice, Piano, and Organ
Music 3CC–103CC (Concert Choir).....16
Music 3–103; Music 18–118 (any large instrumental ensemble).....2
Music 185A–B (Diction I and II).....4
22

String and Harp
Music 3CC–103CC (Concert Choir).....2
Music 3O–103O (Orchestra).....16
Music 3–103; Music 18–118 (any large instrumental ensemble).....2
20

Brass, Woodwind, and Percussion
Music 2–102 (Choral Ensemble) or Music 3CC–103CC (Concert Choir).....2
Music 3WE–103WE (Wind Ensemble).....16
Music 3MB–103MB (Marching Band).....4
22
74–86

Credential Requirements (not necessary for the B.A. degree):
Music 155, 159, 169, 179, T Ed 50.....10

Other Departmental Requirements

1. Each student majoring in music must declare an area of concentration (i.e., an instrument, voice, composition, music history, or music education).
2. At the close of his first semester, each student must pass the preliminary jury examination in his area of concentration before being permitted to continue his major. A further examination must be passed for advanced standing.
3. Each student majoring in music must enroll in a piano class until the departmental piano proficiency examination is passed.
4. Every semester each music major must participate in a major performing organization appropriate to his or her applied music concentration. Violin, viola, cello and double bass majors will participate in Orchestra. Wind and percussion majors will participate in Wind Ensemble. Voice majors will participate in Concert Choir. Guitar and piano majors will substitute Guitar Ensemble, Keyboard Ensemble, Music 130T (Chamber Music Ensemble), or Music 130T (Accompanying) for 50 percent of the major performing ensemble requirement. (Option II majors in these areas must consult their credential adviser.) IN ADDITION: Applicants for the public school credential, before qualifying for the credential, must participate in at least one semester of any major instrumental ensemble and one of any major choral ensemble. Applicants who are wind and percussion specialists must participate in at least two semesters of marching band and one of any major choral ensemble.
5. Participation in all rehearsals and performances of the performing organizations for which the student registers must take precedence over any conflicting activity.
6. Students in Music 31S–131S through 39S–139S will appear in student recitals when assigned.
7. Each student majoring in music must attend a designated number of recitals or concerts.
8. A senior project is required of each student during his final year. For those whose area of concentration is voice or an instrument the project will be a public recital; for details, consult the Music Department Office.
9. No course used to satisfy General Education CAPSTONE requirements may be used to satisy Music major requirements.
10. Option II music majors, whose major instrument is piano or guitar or whose concentration is music history or composition/theory, must pass the Level II Jury Exam in *one* of these areas: voice; violin; viola; cello; contra bass; clarinet; flute; saxophone; oboe; bassoon; trumpet; trombone; horn; tuba; or percussion.
11. All Option II students must pass a conducting proficiency examination after completion of Music 158.
12. All undergraduate students must fulfill the upper-division writing skills requirement in order to graduate. Students are expected to meet this requirement the semester after they complete 56 units.

Music Minor

The minor in music requires completion of at least 20 units of music courses, 6 units of which must be upper division. The program must be approved by the department adviser and the department chair. Required units usually include: Music 9 (or 40 and 41); 6 units of Music 31S–131S through 39S–139S; 6 to 9 units in music literature. In addition, students minoring in music must enroll in a major performing organization (see #4 above) each semester of the junior and senior years.

Even though I'm playing my music in Moscow, I'm still not very far from that little town in Iowa.

Steven Schick
Professor, Music

Graduate Program

The Master of Arts degree program in music is designed to increase the candidate's professional competence, to increase the ability for continued self-directed study, and to provide opportunity for greater depth in the chosen area of concentration within the field of music.

Foreign students must have achieved a minimum TOEFL score of 550 to gain entrance to the program. A score of 440 or higher on the Graduate Record Examination (GRE) Advanced Test in Music is required for advancement to candidacy. This test should be taken as early as possible, at least once prior to classification.

Master of Arts Degree Requirements

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Thesis Alternatives.*)

The Master of Arts degree program in music requires a bachelor's degree in music or the equivalent. Students must have achieved a minimum score of 450 on the verbal portion OR 430 on the quantitative portion of the GRE.

All entering M.A. students must take diagnostic entrance examinations in music history and music theory. Where needed, remedial work may be required prior to graduate study. An audition and/or entrance interview is also required.

Under the direction of graduate advisers, each student prepares and submits a coherent program individually designed within the following framework:

Courses in music, including at least 15 units in 200-series

Specific requirements	*Units*
Music 204, 220, 1 music history seminar (Music 260, 267, 277, 287), and Music 211 or another performance class by advisement	11
Concentration	
Music education, performance, music theory/composition, music history	9–12
Electives	
Courses in music or related fields, including at least 3 units in a subject other than music	4–7
Project or thesis	3
Total minimum	30

Students with concentrations in vocal performance, choral conducting, and music history must satisfy foreign language requirements (see area adviser). Courses in addition to those above may be specified after examination of the student's record and the student's performance on the diagnostic entrance examination. A maximum of four units in Music 102–121 taken after completion of the B.A. may be applied to the M.A. degree. A written qualifying examination is required for admission to project or thesis.

COURSES

Music (Music)

Performing Organizations

All performing organization courses may be repeated for credit and are open to both lower- and upper-division students.

The courses below include the technical, stylistic, and aesthetic elements of musical literature; rehearsal and public performance.

2–102. Choral Ensembles (1; repeatable for credit). Study and performance of choral literature appropriate for groups such as community chorus (CC), chamber singers (CS), jazz singers (JS), men's chorus (MC) and women's chorus (WC). General Education BREADTH, Division 4.

3–103. Major Performing Ensembles (2; repeatable for credit). Study and performance of choral and instrumental literature appropriate for groups such as concert choir (CC), orchestra (O), wind ensemble (WE), marching band (MB) and symphonic band (SB). General Education BREADTH, Division 4.

18–118. Instrumental Ensembles (1; repeatable for credit). Study and performance of instrumental literature appropriate for chamber groups such as brass ensemble (BE), guitar ensemble (GE), string ensemble (SE), woodwind ensemble (WWE), keyboard ensemble (KE) and percussion ensemble (PE). General Education BREADTH, Division 4. (Course fee, $20.)

21–121. Performance Workshops (2; repeatable for credit). Study and performance of music literature appropriate for groups such as jazz workshop "A" (JWA), jazz workshop "B" (JWB), basketball band (BB), band workshop (BW), opera workshop (OW) and percussion workshop (PW). General Education BREADTH, Division 4. (Course fee, $20.)

130T. Topics in Performance (1–2; repeatable for credit). Special studies in vocal or instrumental music, including topics such as accompanying, electronic instruments, and mixed chamber music.

Instrumental and Vocal Lessons

Music 31S–131S through 39S–139S include studies in technical, stylistic and aesthetic elements of artistically performing repertory from the standard literature of etudes, solo, chamber, and large ensemble music and are repeatable for credit. For Music majors and minors, concurrent enrollment in an appropriate major ensemble is required. All courses are repeatable for credit.

31S–131S. Brass (2).

32S–132S. Percussion (2).

33S–133S. Strings (2).

35S–135S. Woodwinds (2).

36S–136S. Piano (2).

37S–137S. Harp (2).

38S–138S. Organ (2).

39S–139S. Voice (2).

1A. Ear Training and Sight Singing I (1; max total 2, repeatable for credit). Basic drill in the singing and recognition of intervals, scales, and diatonic melodies, in treble, bass, alto and tenor clefs. Dictation of diatonic melodies and counterpoint in first and second species. *CR/NC* grading only.

1B. Ear Training and Sight Singing II (1; max total 2, repeatable for credit). Prerequisite: Music 1A. Continuation of Music 1A. Extension of melodic sight singing and dictation to include chromatic passing tones and more complex rhythms. Drill in the singing and recognition of the basic varieties of triads and seventh chords. Harmonic dictation; recognition of basic chord patterns and cadences. *CR/NC* grading only.

9. Introduction to Music (3). Not recommended for music majors. Theory necessary for the reading, playing and understanding of music by the layman and the elementary credential candidate. General Education BREADTH, Division 5.

40. Theory of Music I (3). Prerequisite: Music 9 or the ability to read music. Fundamentals of music. Tonal species counterpoint in two and three voices.

41. Theory of Music II (3). Prerequisite: knowledge of music fundamentals (scales, intervals, keys, triads); Music 40 preferred. Harmonic and contrapuntal practice of the 17th and 18th centuries. Development of written skills, concentrating on four-voice chorale settings.

42. Theory of Music III (3). Prerequisite: Music 41. Continuation of Music 41, with emphasis on 19th century harmonic and contrapuntal practice. Introduction to analytic-reductive techniques.

43. Theory of Music IV (3). Prerequisite: Music 42. Survey of the compositional practice of the 20th century, with analysis of selected works.

48. Composition (3; max total 9). Prerequisite: permission of instructor. Aural-analytic introduction to and study of origins and developments of major compositional concepts and genres in Western music; assigned exercises and creative writing in a variety of styles and idioms; the problems of concepts in notation.

58. Basic Conducting (2). Prerequisite: Music 41. Fundamentals of conducting and score-reading; standard patterns and stick technique. Required of all Single Subject Teaching Credential candidates.

61. Music Literature (2). Introductory course in music literature, primarily for music majors and minors. Masterpieces of Western music from the Middle Ages through the 20th century.

74. Listener's Guide to Music (3). Exploration of Western classical, jazz, folk and non-western musical styles through recordings and live lecture-performances presented by CSUF music ensembles, faculty and guest artists, emphasizing the roles music and musicians play in various world cultures. General Education BREADTH, Division 5.

119I. Upper Brass Pedagogy (1). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching trumpet and horn in the elementary school, high school and community college. (Course fee, $20.) (Former Music 119A)

119J. Lower Brass Pedagogy (1). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching trombone, baritone and tuba in the elementary school, high school and community college. (Course fee, $20.) (Former Music 119A)

119K. Upper String Pedagogy (1). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching violin and viola in the elementary school, high school and community college. (Course fee, $20.) (Former Music 119C)

119L. Lower String Pedagogy (1). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching cello and string bass in the elementary school, high school and community college. (Course fee, $20.) (Former Music 119C)

119M. Single Reed Pedagogy (1). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching clarinet, saxophone and flute in the elementary school, high school and community college. (Course fee, $20.) (Former Music 119D)

119N. Double Reed Pedagogy (1). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching oboe and bassoon in the elementary school, high school and community college. (Course fee, $20.) (Former Music 119D)

119O. Percussion Pedagogy (2). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching percussion instruments in the elementary school, high school and community college. (Course fee, $20.) (Former Music 119B)

119P. Keyboard Pedagogy (2). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching keyboard instruments in the elementary school, high school and community college. (Former Music 119E)

119Q. Voice Pedagogy (2). Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching voice in the elementary school, high school and community college. (Former Music 119F)

130T. Topics in Performance (1–2; repeatable for credit). Special studies in vocal or instrumental music, including topics such as accompanying, electronic instruments, mixed chamber music.

140T. Topics in Theory and Composition (3; max total 9). Prerequisite: Music 40, 41, 42, 43. Technical, stylistic and aesthetic elements of theory and composition.

141. Seminar in Modal Counterpoint (3). Prerequisite: Music 42, 43. Polyphony of the 15th and 16th centuries; analysis and composition of melodic lines, simple counterpoint, types of imitation; writing motets with text in two or more parts.

142. Seminar in Canon and Fugue (3). Prerequisite: Music 42, 43. Polyphony of the 17th and 18th centuries; analysis and composition of melodic lines, imitative, strict and invertible counterpoint, canon and fugue.

144. Form and Analysis (3). Prerequisite: Music 42. Principles of musical form and analysis as applied to standard works of the 18th and 19th centuries. Includes an introduction to the Schenker method of music analysis and review of chromatic harmony as necessary.

148. Seminar in Advanced Composition (3; max total 9). Prerequisite: Music 42, 43. Seminar in original composition of a thoroughly contemporaneous nature in media, forms and styles of student's choice.

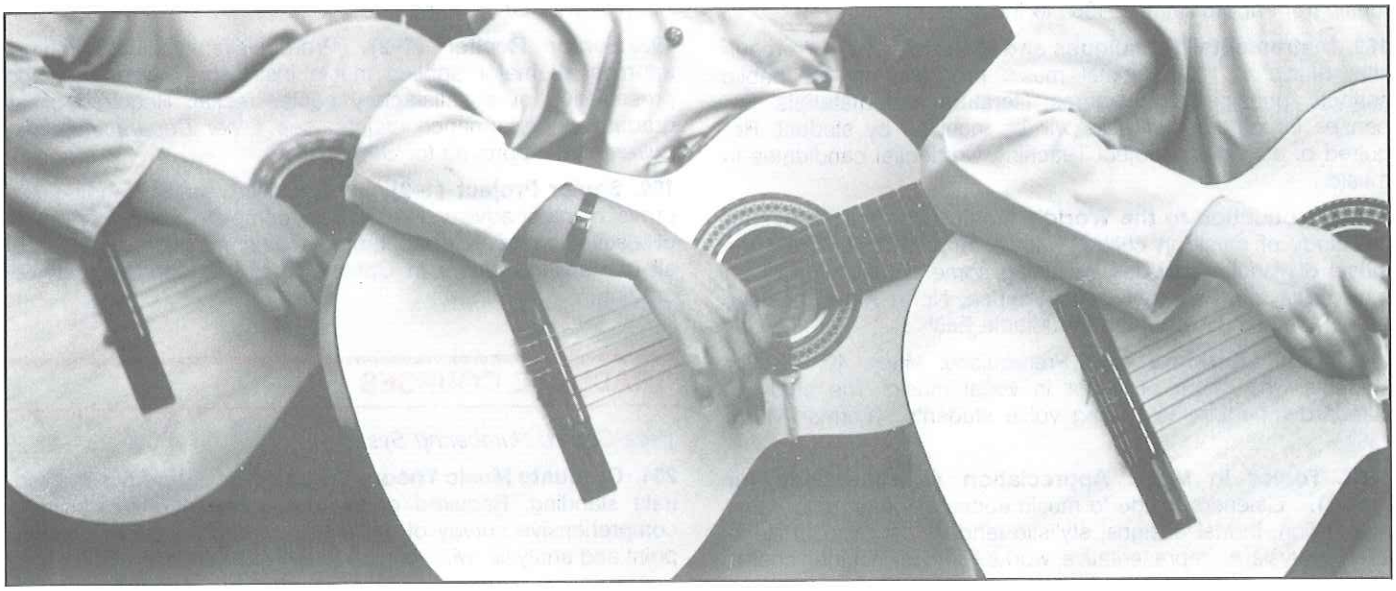
150A. Seminar in Electronic Music I (3). Prerequisite: Music 40, 41 and permission of instructor. A survey of the history and literature of electronic music. A systematic introduction to basic analog synthesis, and instruction in the techniques of studio recording and editing.

150B. Seminar in Electronic Music II (3). Prerequisite: Music 150A and permission of instructor. Advanced applications of analog synthesis and recording engineering. Emphasis on the individual creative process.

150C. Seminar in Electronic Music III (3). Prerequisite: Music 150B and permission of instructor. An introduction to computer applications in digital/analog synthesis. Introduction in multi-track mixing and recording.

150D. Seminar in Electronic Music IV (3). Prerequisite: Music 150C and permission of instructor. Advanced computer controlled digital/analog synthesis. Emphasis on the individual creative process.

153. Children's Music (3). Open to non-majors. Introduction to song literature and singing games suitable for children. Development of in-tune singing, ear training and sightsinging skills.



155. Sound, Rhythm, and Song (3). Prerequisite: Music 40, 41 for students majoring in music; Music 9 for others. Individual research on the place and functions of music in the pre-school and elementary school curriculum; selection, discussion and analysis of musical materials including state texts; planning activities that enable children to develop aesthetic sensitivity, musical skills and understanding.

158A. Advanced Instrumental Conducting (2; max total 4). Prerequisite: Music 58A. Advanced instrumental conducting and score reading; rehearsal techniques; problems in tempo, balance, style and phrasing; mixed meters and other contemporary problems. Assigned projects in conducting. Required of all Single Subject Credential candidates in Music.

158B. Advanced Choral Conducting (2; max total 4). Prerequisite: Music 58B. Advanced choral conducting and score reading; rehearsal techniques; problems in tempo, balance, style and phrasing; mixed meters and other contemporary problems. Assigned projects in conducting. Required of all Single Subject Credential candidates in Music.

159. Marching Band Techniques (1). Prerequisite: Music 41. Offered first semester only. Practical and creative aspects of producing musical shows and marching formations for athletic events, parades and public ceremonies. Required of all Single Subject Teaching Credential candidates in Music.

160T. Topics in Music History, Literature and Appreciation (1–3; max total 9). Prerequisite: Music 161A. Study of selected musical genres, composers and other specialized topics. 160TW *Writing About Music* (Prerequisite: Engl 1) meets the upper-division writing skills requirement for graduation.

161A. Survey of Music History I (3). Prerequisite: Music 61, permission of instructor. Lectures, discussion and reports on music from the early Middle Ages to approximately 1680. General Education CAPSTONE Cluster.

161B. Survey of Music History II (3). Prerequisite: Music 61, permission of instructor. Lectures, discussion and reports on music from approximately 1680 to 1880. General Education CAPSTONE Cluster.

161C. Survey of Music History III (3). Prerequisite: Music 61, permission of instructor. Lectures, discussion and reports on music from approximately 1880 to the present.

169. Instrumental Techniques and Materials (2). Prerequisite: Music 41. Instrumental music programs in the public schools; principles, procedures, literature and materials. Expenses for off-campus visits will be incurred by student. Required of all Single Subject Teaching Credential candidates in music.

171. Introduction to the World's Music (3). Introduction to the study of music in culture, with examples drawn from the music of various societies, including some combination of art music and folk music of Latin America, North America, Asia, Africa, Western Europe and the Middle East.

172. Vocal Literature (2). Prerequisite: Music 40, 41. For students who major or minor in vocal music. The study of standard repertoire for young voice students. (Former Music 130T).

176T. Topics in Music Appreciation (3; repeatable for credit). Listeners' guide to music appreciation; structure and expression, formal designs, stylistic tendencies; musical literature, analysis of representative works. Topics include: choral, wind, brass, percussion, string, chamber, keyboard, orchestral, vocal recital, opera, avant-garde, folk and ethnic, jazz and rock, and musical theatre.

179. Choral Techniques and Materials (2). Prerequisite: Music 41, 58. Vocal music programs in the public schools; principles, choral techniques, literature and materials. Expenses for off-campus visits will be incurred by student. Required of all Single Subject Teaching Credential candidates in music.

182. Band Arranging (3). Scoring and arranging for the Band and Wind Ensemble; problems in idiomatic writing for individual instrument and sonorities of instruments in combination. Ranges, transposition, technical capabilities of band and orchestra instruments and the voice.

183. Choral Arranging and Lit (3). Scoring and arranging for various sizes and types of choral ensembles; compositions for most choral idioms are examined and surveyed.

184. Orchestral Arranging (3). Scoring and arranging for orchestral ensembles; problems in idiomatic writing for the instruments and sonorities of instruments in combination. Ranges, transposition, technical capabilities of band and orchestra instruments and the voice.

185A. Vocal Diction I (2). Prerequisite: Music 40, 41. For students who major or minor in vocal music. The study of the International Phonetic Alphabet and its application to singers' pronunciation of English, Italian, and Latin. (Former Music 130T).

185B. Vocal Diction II (2). Prerequisite: Music 185A. For students who major or minor in vocal music. Singers' diction studies of French and German. (Former Music 130T).

187. Pop Music: Jazz and Rock (3). Styles of Pop Music with special emphasis on Jazz and Rock and their influence on life styles. General Education CAPSTONE Cluster.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

191. Readings in Music (1–3). Prerequisite: permission of instructor. Readings in depth and discussions in individual conferences; subject to be selected by student and his adviser. May be preliminary research in connection with thesis topic. Approved for *SP* grading.

198. Senior Recital (1–2). Prerequisite: senior standing, approval of major applied music instructor. Preparation and presentation of a satisfactory senior recital. Required of all graduating performance majors; see *Other Departmental Requirements.* Approved for *SP* grading.

199. Senior Project (1–2). Prerequisite: senior standing, approval of major adviser. Preparation, completion and submission of a suitable research paper, study or composition. Required of all graduating seniors in Options Ib, Ic, II. Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.*)

204. Graduate Music Theory Survey (3). Prerequisite: graduate standing. Required of all M.A. candidates in music. A comprehensive survey of the disciplines of harmony, counterpoint and analysis, with respect to the music of the 18th through

20th centuries, with an emphasis on review and reinforcement. Topics include species counterpoint, figured bass, voice leading, principles of Schenkerian analysis, and basic atonal and twelve-tone theory.

205. Seminar in Analysis, I: Tonal Music (3). Principles of musical form and analysis as applied to representative works of the 18th and 19th centuries.

206. Seminar in Analysis, II: Nontonal Music (3). Development of a descriptive vocabulary suitable for the music of the twentieth century, with special reference to works by Schoenberg, Berg, Webern and selected American composers.

210. Studies in Performance (2; max total 6). Open only to master's degree students majoring in performance or to other Master's students by consent of instructor. Prerequisite: Music 220 and permission of department chair. Individually directed studies in performing or conducting instrumental or vocal music; historical and theoretical interpretation applied in preparation for public recitals and concerts of works from the standard literature of all periods in the student's major performance area. Approved for *SP* grading.

211. Graduate Performance Ensemble (2; max total 6). Prerequisite: graduate standing or permission of instructor. Ensemble performance of instrumental or choral music with emphasis on historical and theoretical interpretation of advanced level literature. This course includes technical, stylistic, and aesthetic elements of musical literature, rehearsal and public performance.

219T. Seminar in Music Education (3; max total 9 if no course repeated). Prerequisite: Music 155, T Ed 161 and permission of the instructor. Topics of special concern to the teacher or administrator. Individual research projects and discussion of problems in the area of literature, philosophy, and practices of teaching, administration and curriculum planning.

220. Seminar in Research Methods and Bibliography (3). Prerequisite: Music 161A, B. Bibliography, sources, and research techniques necessary for graduate study in music. Individual projects and research. Required of all students working for the master's degree in music.

221. Foundations of Music Education (3). Historical, curricular and philosophical foundations of music education. Research in learning theories, teaching strategies and concept development. Evaluation of contemporary trends and techniques in methodology.

234. Studies in Composition (3; max total 9). Open only to master's degree students majoring in composition. Prerequisite: Music 220. Individually directed studies in composition with contemporary techniques of an extended work equivalent in substance to a sonata, cantata or other composition of major proportions. Approved for *SP* grading.

258T. Topical Seminars in Conducting (1–3; max 6). Prerequisite: Music 158A or B. Advanced studies in selected topics related to conducting. Projects with particular attention to rehearsal techniques, score preparation and interpretation.

259T. Topical Seminars in Vocal Music (1–3; max 6). Prerequisite: Music 119Q. The study of advanced level song literature, song interpretation and performance practice as applied to standard and special vocal repertoire.

260T. Topic Seminar in Music History (3; max 9). Current methods, resources, and issues in music history, with application to specific topics focusing on major Western composers, major genres, landmark works or repertories, issues in musical aesthetics and criticism.

267. Seminar in Contemporary Music (3). Prerequisite: Music 220. Critical and analytical study of the sources, selected works, and composers of the 20th century, with particular emphasis on avant-garde movements and schools. A term paper will be a central requirement for successful completion of this course.

269T. Topical Seminars in Instrumental Music (1–3; max 6). Prerequisite: Music 169. The study of advanced level instrumental literature, score interpretation and performance practices as they apply to standard and special instrumental literature.

277. Seminar in American Music (3). Prerequisite: Music 220. Critical and analytical study of the historical sources, selected works and composers in the United States from 1620 A.D. to the present. A term paper will be a central requirement for successful completion of this course.

279T. Topical Seminars in Choral Music (1–3; max 6). Prerequisite: Music 179. The study of advanced level choral literature, performance practices, interpretation and rehearsal techniques pertinent to various choral ensembles.

287. Seminar in Interpretation of Earlier Music (3). Prerequisite: Music 220. Historical study of performance practices from the Middle Ages to the early classic era. Individual research projects and class discussions centered on primary theoretical and musical sources.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

291. Readings in Music (1–3). Prerequisite: permission of instructor. Readings in depth and discussions in individual conferences; subject to be selected by student and his adviser. May be preliminary research in connection with thesis topic. Approved for *SP* grading.

298. Project (3). See *Criteria for Thesis and Project.* Completion of an approved project appropriate to the candidate's area of specialization. To be used in place of Music 299 for majors in performance, composition, and as an option for majors in music education. The graduate recital, for performance majors, will consist of an approved program containing at least one hour of music. May not be used by students majoring in musicology. Approved for *SP* grading.

299. Thesis (3). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSES

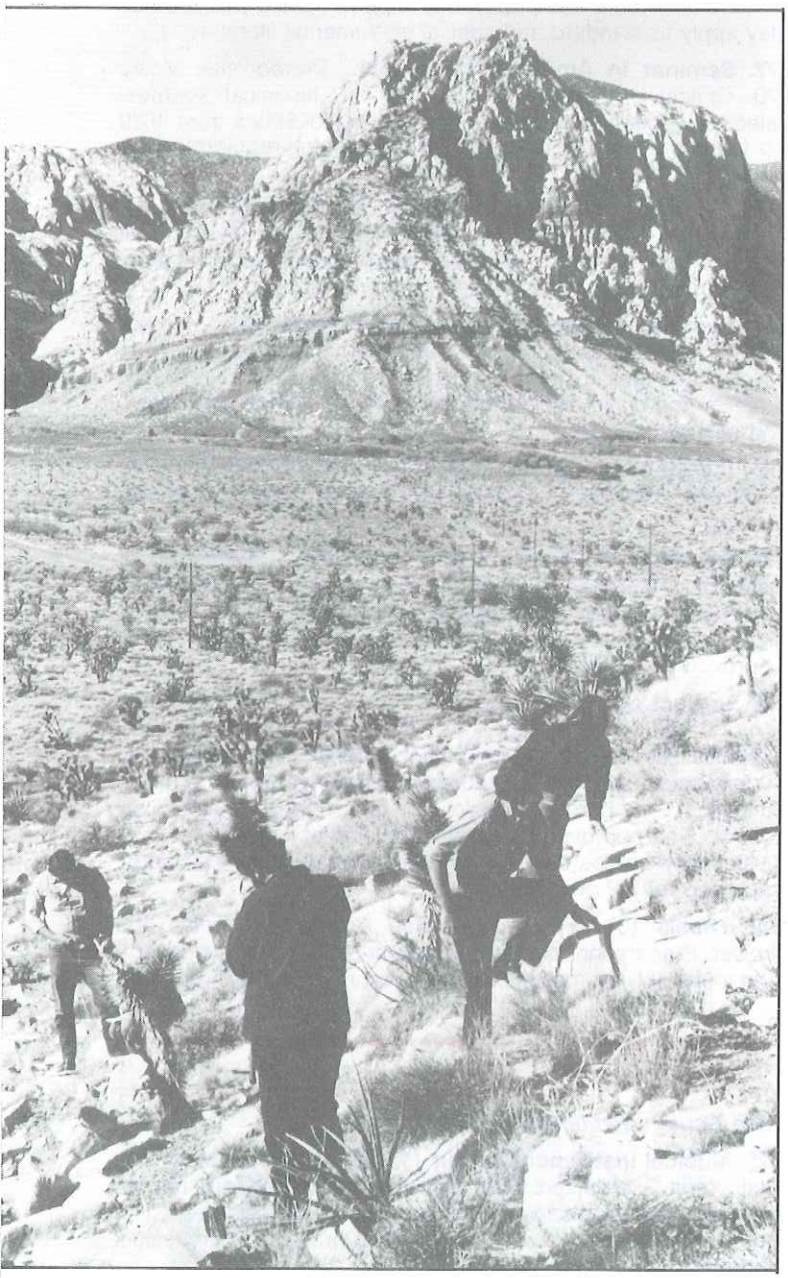
(See *Course Numbering System.)*

307. Musical Instrument Repair (1; max total 3). Maximum total credit 3 units, provided instrumental groups are not repeated. Criteria for selection; techniques for care and repair of music instruments. Instrumental grouping: brass and percussion; woodwind and strings; piano.

309T. Workshop: Vocational and Avocational Music Topics (1–3). Topics such as: New State Music Textbooks, Elementary School Classroom Instruments, Folk Music and Dancing, Piano Teachers' Workshop, Brass Music, Creative Approaches to Classroom Music, Exploring Sound and Music.

NATURAL SCIENCE
Interdisciplinary Courses

School of Natural Sciences
Kin-Ping Wong, Dean
Science Building, Room 101
(209) 278-3936



The School of Natural Sciences provides a number of natural science courses which include a variety of subjects. These courses help students gain an understanding of science in conjunction with their related disciplines.

The school requires that new faculty possess the appropriate terminal degree recognized in their discipline. The school has 110 permanent faculty with 100 percent holding the doctorate in their discipline granted by some of the most prestigious universities in the nation and abroad.

COURSES

Natural Science (N Sci)

1. The Art of Medicine (1; max total 4). Primarily for pre-health-care students. Delivery of health care today. Concepts of the art of medicine presented by community physicians and specialists.

4. Science and Nonsense: Facts, Fads and Critical Thinking (3). Use of language, thought and logic in science, distinguishing science fact from science fiction. Inductive and deductive methods, judgment, opinion, belief and knowledge. A critical examination of contemporary pseudoscientific issues (creation "science," UFOs, astrology, etc.). General Education CORE, Critical Thinking.

15. Environmental Science: An Integrative Course (2). Concurrent enrollment in Anth 15, Biol 15, Geol 15 required. Portion of *Man and the Natural Environment* Cluster. A study of the interrelationships among the anthropological, biological and geological aspects of man and the natural environment. Team taught. *CR/NC* grading only.

37. Math Confidence (2) (Same as W S 37). Concurrent enrollment in a math class commensurate with the student's math achievement level is recommended but not required. This course is designed to increase confidence in math-related problem solving situations and to increase the student's potential for participation in math-related courses and/or careers. *CR/NC* grading only.

40T. Topics in Natural Sciences (1–4; max total 12). Prerequisite: permission of instructor. Interdisciplinary topics covering such subject matter areas as environmental studies and the impact of science on society.

110. Practicum in Medicine (2). Prerequisite: permission of instructor. Offered in association with the UC Medical Education Program. Premedical students assigned in one or more clinical settings in the community. Emphasis on in-depth association with health professionals for clinical observation and biomedical research experience. (Spring semester)

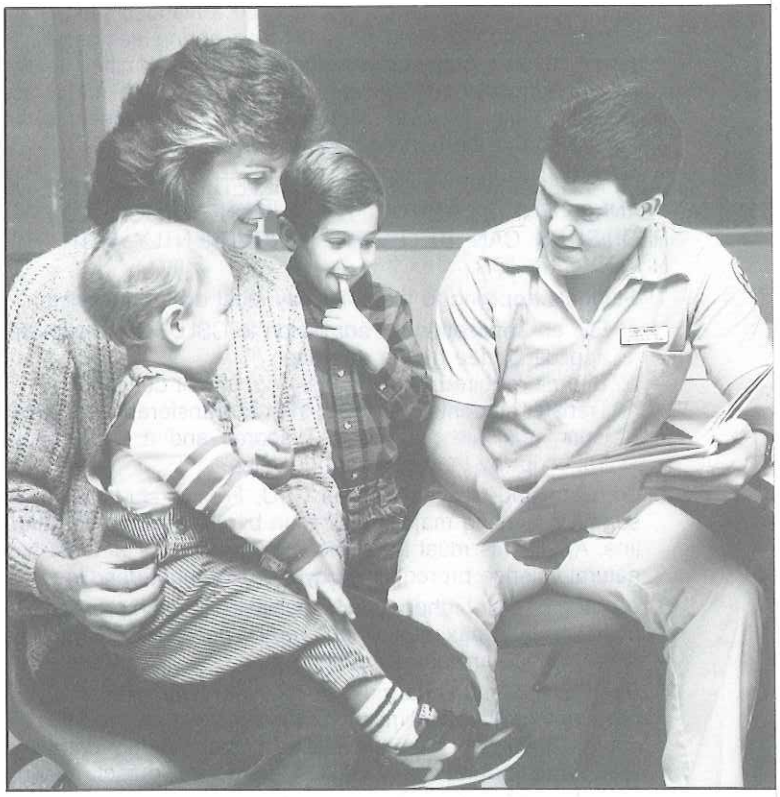
140T. Topics in Natural Sciences (1–6; max total 12). Prerequisite: permission of instructor. Interdisciplinary topics covering such subject matter areas as medical technology and ecology. (May include lab hours)

240T. Topics in Natural Sciences (1–4; max total 8). Prerequisite: permission of instructor. Interdisciplinary topics in the natural sciences at the graduate level covering such subjects as advanced techniques. Sample topics are *Radiation Techniques in Biology and the Physical Sciences* and *Recent Advances in Psychophysiology.* (May include lab hours)

Nursing

School of Health and Social Work
Department of Nursing
Pauline Kliewer, Chair
McLane Hall, Room 178
(209) 278-2041

B.S. in Nursing
School Nurse Health Services Credential
M.S. in Nursing
Options:
Administration
Education
Clinical Specialization
Nurse Practitioner



The process of nursing consists of systematic assessment, planning, implementation and evaluation of care. Nursing assumes the primary responsibility for providing holistic care to the client by utilizing significant support systems, such as the family and community.

The department offers an undergraduate program which leads to the Bachelor of Science degree in Nursing, a postbaccalaureate Health Services Credential Program in School Nursing, with an option to pursue the master's degree in nursing, and a graduate program leading to a Master of Science degree in Nursing.

Undergraduate Program

The program requires six semesters of nursing courses in addition to two semesters of prerequisite requirements. The basic General Education requirements are the same for all majors. Upon completion of the sixth semester clinical course sequence, the student is qualified to take the National Council Licensure Examination (NCLEX-RN) and apply for the Public Health Nurse Certificate issued by the California Department of Health. CSU, Fresno's nursing program is accredited by the California Board of Registered Nursing and the National League for Nursing (NLN).

Clinical Facilities

A wide variety of clinical resources is used, including Fresno Community Hospital and Medical Center, St. Agnes Medical Center, Valley Children's Hospital, Veterans Administration Medical Center, Kings View Center, Valley Medical Center, Fresno County, Madera County, Kings County and Tulare County Health Departments, Central Valley Indian Health, Associated Indian Services, Hope Manor, and Armenian Home.

Advanced Placement in the Nursing Major

Students seeking advanced placement must seek advisement from the department. Students are expected to meet all prerequisites for admission and meet filing deadlines specified for undergraduate students.

Registered Nurses

Registered nurses with an associate degree in nursing may articulate at the junior level in the major. Registered nurses from diploma programs may seek advanced placement through credit by examination (see *Academic Placement — Credit by Examination*).

Registered nurses are in a separate admission pool from the generic nursing applicants.

Licensed Vocational Nurses

Licensed Vocational Nurses are offered three options:

1. Generic Nursing Program.
2. Transfer/Credit by Examination.
3. Thirty-Unit Option (non-degree).

Health Related Personnel

Medical corpsmen, psychiatric technicians and others are eligible for credit by examination under the university's policy as outlined in the current catalog.

Faculty

Pauline Kliewer, *Chair*

Carol L. Avent
Martha A. Davis
Marlene A. Dehn
Glen C. Doyle
M. Joan Fiorello
Filomena C. Flores
Mary R. Ivan
Judith S. Keough
Patricia D. Kissell
Fred C. Krell
Selwa H. Makarem
Mariamma K. Mathai
Michael F. Russler
Eleanor M. Stittich
Margaret C. Thorburn
Elizabeth H. Wilkerson

Policies and Procedures for Admission

Admission to the generic program is a two-step process: 1) admission to the university and 2) admission to the nursing major. Approximately 56 generic and 20 advanced placement RN students are admitted both fall and spring semesters. A separate nursing major application must be submitted to the Office of Admissions where all applications to the major are screened. Applicants must meet all criteria for admission to the university and to the nursing major.

ALL PREREQUISITES MUST BE COMPLETED BY THE TIME OF PLANNED ENROLLMENT IN THE NURSING MAJOR. NO PREREQUISITES CAN BE TAKEN CONCURRENTLY WITH THE NURSING MAJOR.

1. Students applying to the university must do the following:
   a. File an application for admission to CSU, Fresno with the application fee by the deadline.
   b. Submit required transcripts by document deadline.
   c. Transfer students with fewer than 56 transferable semester units must file ACT or SAT scores and a high school transcript by the document deadline.
2. Transfer students, as well as CSU, Fresno students, must submit a nursing major application by the application deadline. Applicants must have recorded grades for at least two natural science prerequisites by the document deadline.
3. A grade of *C* or higher must be achieved in each prerequisite course with a maximum of one repeat per course. Credit/no credit grades are not acceptable.
4. Specific health criteria must be met. Students with recurrent infections or physical limitations that preclude meeting clinical course objectives may be unable to satisfactorily complete the requirements for a B.S. in nursing. Contact nursing department regarding any questions.
5. Transfer students who meet the criteria are considered on the same basis as a CSU, Fresno student applying for admission to the major.

University and Nursing Applications and Document Deadlines for B.S. Degree

For application form and further admissions information, write to the Office of Admissions, California State University, Fresno. For further information regarding curricula, write to the **Department of Nursing, California State University, Fresno, CA 93740.**

Fall Admission. Application forms are available November 1.

- University Application Filing Deadline: May 1.
- Nursing Major Application Deadline: June 1. (Applications available from Admissions Office.)
- Document Deadline (transcripts, scores, etc.): June 1.
- New transcripts must include all prior coursework *including* the previous fall term. Final transcripts must be submitted as soon as possible in summer showing the completion of all remaining prerequisite courses.

Spring Admission. Application forms are available August 1.

- University Application Filing Deadline: October 1.
- Nursing Major Application Deadline: November 1. (Applications available from Admissions Office.)
- Document Deadline (transcripts, scores, etc.): November 1.
- New transcripts must include all prior coursework *including* the previous spring and summer terms. Final transcripts must be submitted as soon as possible in January showing the completion of all remaining prerequisite courses.

Progression in the Major. Criteria for retention, progression and graduation from the program include a minimum grade of *C* in each required course and each nursing course offered for a grade, and credit in courses offered for credit/no credit only. Nursing and required courses may be repeated only once to achieve a *C* or credit grade. Any student who receives less than a *C* grade (or no credit) in two nursing courses will not be permitted to continue in the major. Refer to the *Student Handbook, Baccalaureate Degree Nursing Program,* for complete progression and retention policies.

Expenses. Students must be prepared to incur any additional cost such as uniforms, malpractice insurance, health insurance, stethoscopes, course syllabi, lab fees, etc., and be responsible for transportation to clinical facilities. A current CPR certification is required.

Bachelor of Science Degree Requirements Nursing Major

Units

1. Major requirements* — generic students 62
   Nurs 10, 10L, 10S, 11, 110, 110L, 110S, 111, 120, 120L, 121, 121L, 122, 130, 130L, 131, 131L, 140, 140L, 141, 141L, 141S, 145, 150, 150L, 151, 180T (2 units)
2. Major requirements* — RN students only 62
   Nurs 135, 136, 140, 140L, 141, 141L, 141S, 145, 150, 150L, 151; 3 units of nursing electives; 30 transfer nursing units
3. Prerequisite requirements
   Courses which *must* be completed *before* entrance into the Nursing Major 30–31
   Chem 3A and 3B; Phy 64 and 65; FScN 52 or 53; Engl 1; Psych 10; Anth 2 or Soc 1, 2, or 3; Spch 8 preferred (or Spch 3 or 7)
4. Additional requirements
   Courses which are prerequisite to specific nursing courses 16
   a) Introduction to Statistics; H S 92 or Math 11, (Recommended)
   b) Micro 20 or 104
   c) Phil 120
   d) 3 units of Ethnic/Women's Studies
   e) CFS 38
   (Consult nursing course descriptions)
5. General Education requirements 51
   (See Notes 1–2 below)

Minimum Total 130

* See the nursing department for course descriptions not found in this catalog and for advising.

Notes:

1. Several prerequisite units also may be used to satisfy General Education requirements.
2. Most of the units in additional requirements may be used to satisfy General Education requirements, including Micro 20 or 104 that fulfills the Division 2 requirement only for nursing majors.
3. Students must complete the upper division writing skills requirement in order to graduate.
4. Optional *CR/NC* grading is not permitted in the nursing major.
5. Students are required to meet with their faculty adviser at least once each semester. Contact the department office for your faculty adviser's name, office number and office hours.
6. A 2⅔ or 3 unit transfer introduction to psychology class is accepted in lieu of Psychology 10. Also, 4 quarter-unit classes are accepted as equivalent to 3 semester-unit classes.
7. All Practicum courses (with suffix "S" or "L") require a minimum of three hours of clinical per unit of credit as a minimum to meet course objectives.

Postbaccalaureate Health Services Credential Program — School Nursing

The Health Services Credential Program provides basic preparation for professional roles in school nursing. The program, approved by the California Commission on Teacher Credentialing, leads to the Professional Health Services Credential. The Department of Nursing, in conjunction with the School of Education and Human Development, recommends qualified candidates for credentialing as providers of health services in California public schools (preschool, K–12, adult).

The program of study consists of a minimum of 30 units. Courses taken in NLN accredited baccalaureate programs may be accepted for the credential at the discretion of the Department of Nursing.

		Units
C D 103	Speech Science II	3
C D 128	Observation in Communicative Disorders: Audiology	1
C D 131	Principles in Audiology	3
	or	
Nurs 302T	Audiometry for School Nurses	3
H S 92	Public Health Statistics	3
C D 114	Education of Exceptional Children	3
	or	
Psych 168	Exceptional Children	3
	or	
A S 111	Mainstreaming Exceptional Children	2
	and	
A S 115F	Field Work in Special Education	1
A S 174	Introduction to Counseling	3
	or	
A S 224	Seminar in Counseling Techniques	3
Nurs 136	Health Appraisal*	3
Nurs 137	Teaching of Health Clients (microteaching required)*	3
Nurs 145	Nursing Theories and Research*	3
Nurs 185	Seminar in School Nursing*	3
Nurs 186	School Nurse Practicum (elementary)*	3
Nurs 187	School Nurse Internship (secondary)*	3

* Courses only available through regular enrollment in the university following acceptance into credential program.

Note: A minimum of 15 units in the credential program must be taken on the CSU, Fresno campus. The use of any comparable course is contingent upon departmental approval. Coursework taken more than 10 years ago is not acceptable to meet program requirements.

A maximum of 9 units is allowed through courses taken in Extended Education or concurrent enrollment.

Proof of current malpractice insurance and a health clearance are required prior to enrollment in Nurs 186 and 187. Health clearance is obtained through Student Health Services.

The student must hold either a Certificate of Clearance *or* a Preliminary Health Services Credential prior to enrollment in Nurs 186 and 187. Contact the credentials analyst, Education/Psychology Building, Room 120, (209) 278-3084, for application/information.

All admission requirements (credential program application form, admission to the university, all documents and prerequisites) must be completed prior to enrollment in any of the nursing courses.

Admission Criteria

1. Baccalaureate degree in nursing from a NLN accredited program.
2. Admission to the university at the postbaccalaureate level.
3. Current California Registered Nurse License.
4. California Public Health Nurse Certificate.
5. Overall GPA of 2.5 and 3.0 in nursing.
6. Three satisfactory letters of recommendation (at least one from a recent employer or nursing faculty).

Admission Procedure

1. Complete application for admission to postbaccalaureate standing, Admissions Office, Joyal Building. Forward copy of application to Department of Nursing, health services coordinator.
2. Complete Credential Program application (available from the Department of Nursing).
3. Attach transcripts of previous academic work.
4. Attach photocopies of required documents (RN License, PHN Certificate).
5. Submit three letters of reference/recommendation (forms available from Department of Nursing).
6. Complete locator card in School of Education and Human Development, Credential Analyst's Office, Education/Psychology Building, Room 120.
7. Arrange appointment with coordinator, Health Services Credential Program, for program planning/advising.

Note: All candidates are required to sign a statement on the application form regarding conviction or plea of nolo contendere for any violation of law other than minor traffic offenses.

Candidates with conviction may be refused a Health Services Credential. For further information, contact the credentials analyst, Education/Psychology Building, Room 120, (209) 278-3084.

Time Restrictions. All requirements for a Professional Health Services Credential must be completed within five years of the date of issuance of the preliminary credential.

Articulation with Graduate Program

Students who wish to pursue a master's in nursing must consult the graduate curriculum coordinator. Articulation with options in clinical specialist/community health or primary care/pediatric nurse practitioner are available.

Graduate Program

The department offers a NLN accredited program that leads to a Master of Science degree in Nursing. In addition to advanced practice in a clinical area, students elect a functional role as administrator, clinical specialist, educator or practitioner.

The purpose of nursing education at the master's level is to help students apply advanced theory and practice with advanced skills in complex client and community systems. It further seeks to provide students with advanced skills in leadership and research in order to improve the health care of individuals, families and communities. The program provides a foundation for doctoral study in nursing.

Facilities. The diverse facilities of the community provide a wide variety of stimulating opportunities for individualized pursuit of student goals. Graduate and postbaccalaureate students have clinical placements which are consistent with their career goals.

Admission Criteria

1. Admission to California State University, Fresno, Division of Graduate Studies.
2. Baccalaureate degree in nursing from an NLN accredited program.
3. Registered nurse license in California (may be waived for nurses licensed in another country).
4. Overall GPA of 2.5 with 3.0 in nursing.
5. GRE score of 450 (verbal) or 430 (quantitative).
6. Malpractice insurance.
7. Three letters of reference (at least one from a recent employer, and if possible one from a recent nursing instructor).
8. A minimum of one year of clinical practice as a registered nurse.
9. An introductory course in statistics.*
10. An introductory course in research.*
11. A physical assessment course that includes theory and practice; or validation of knowledge and skills for graduates of programs with integrated content.

Admission Procedures

1. Request and complete application for admission to graduate standing from Admissions Office, CSU, Fresno.
2. Request official transcripts of previous academic work to be forwarded to Admissions office.
3. Arrange to take Graduate Record Examination. If in Fresno, contact Division of Graduate Studies, CSU, Fresno.
4. Nurse Practitioner students should request and complete special Nurse Practitioner Application available from Nursing Department.
5. Forward three letters of recommendation to:

   GRADUATE PROGRAM COORDINATOR
   Department of Nursing
   California State University, Fresno
   Fresno, California 93740

Admission to the program is limited to the fall semester; students with deficiencies are encouraged to meet the requirements in the previous spring semester.

DEADLINE FOR APPLICATION FOR ADMISSION TO THE PROGRAM IS *APRIL 1.*

Courses

Under the direction of the graduate coordinator, each student prepares and submits an individually-designed program based on the following:

	Units
Core Courses in Nursing: Nurs 223, 224, 225, 226, 228, 229, Soc 174	17
Approved Cognates**	3
Role Specialization Courses (see below)	13
Thesis (Nurs 299) or Project (Nurs 298)	3
Minimum Total	36

Role Specialization (Options)

Nursing Administration
Nurs 240, 242, 243, Bus 214 or GPA 210 (cognate)

Nursing Education
Nurs 230, 232, 234, AS 227 (cognate)

Clinical Specialization
Nurs 250, 251, 7 units clinical cognates

Primary Care Nurse Practitioner

Family
Nurs 210, 265, 266, 267, 277, 278

Pediatric
Nurs 210, 265, 266, 269, 279, 280

Geriatric
Nurs 210, 265, 266, 271, 281, 282

Note:

All practicum courses require a minimum of three hours of clinical work per unit of credit as a minimum to meet course objectives.

Nurs 224 and 226 must be completed prior to taking the Department Qualifying Exam.

Advancement to candidacy is contingent on passing the Department Qualifying Examination. The Department Qualifying Examination is also used to meet the university writing requirement.

Graduate students are responsible for policies and regulations of the Division of Graduate Studies and Research and those specified in the graduate nursing program brochure.

* Course must be taken within five years. Outdated courses may be validated by examinations administered by the department or through enrollment in a course.

** See graduate coordinator for cognates.

Nurse Administrator

The Nurse Administrator option prepares the graduate to assume leadership roles in nursing service organizations. The administration seminars and practicum focus on organization and management theories.

The purpose of the Nurse Administrator option is to prepare knowledgeable and responsible nursing leaders who assume the authority and accountability for the development of nursing service policies and who foster the participation of nursing staff in planning, implementing and evaluating practice to ensure safe, efficient and therapeutically effective care.

Nurse Educator

The Nurse Educator option prepares the graduate to assume teaching roles within an academic or clinical setting. Students elect specific seminars in nursing education and curriculum instruction, as well as an area of clinical focus such as adult/child, community health nursing or community mental health nursing. The student actualizes the role of the nursing educator in the practicum in nursing education.

The purpose of the Nurse Educator option is to prepare knowledgeable, visionary and action-oriented nursing scholars committed to educating today's nurses for tomorrow's changing world and to generate an academic community concerned with the development and emergence of theoretical and scientific concepts related to nursing practice.

Clinical Nurse Specialist

The Clinical Nurse Specialist option prepares the graduate to assume a leadership role with advanced skills, knowledge and competence in a specific area of clinical nursing. Students in this option actualize the role of the clinical specialist in a clinical setting with a master's prepared nurse preceptor. The student is responsible for writing objectives for the experience prior to the clinical placement. Arrangement for clinical placement is made after consultation with the appropriate faculty.

The purpose of the Clinical Nurse Specialist option is to prepare nurses to prescribe and implement both direct and indirect nursing care and to articulate nursing therapies with other nursing personnel and other health providers.

Nurse Practitioner

The Nurse Practitioner option prepares the graduate to provide primary health care to children, the elderly adult and families. Classroom and clinical experiences focus on health assessment, health maintenance and promotion, counseling, client education, and management of selected health problems. Practice in rural settings and with clients from diversified cultural backgrounds is emphasized.

Graduates meet the requirements for recognition as Pediatric, Geriatric or Family Nurse Practitioners in California and may apply for ANA Certification.

The purpose of the Nurse Practitioner option is to prepare nurses as specialists in primary care and to improve the availability, accessibility and quality of primary care services in the central San Joaquin Valley.

COURSES

Nursing (Nurs)

8T. Beginning Topics in Nursing (1–3 units; max total 6 if no topic repeated). Selected topics in nursing for prenursing and/or beginning nursing students. Explores topics not covered in regular nursing courses.

10. Basic Concepts of Nursing Practice (4). Prerequisite: admission to the major; Nurs 10L, 10S, 11 concurrently. Overview of theoretical and scientific foundations of nursing practice. Introduction to physiological, psychological, sociocultural and developmental variables affecting individuals throughout the life span. Emphasis on basic concepts of pharmacotherapeutics and wellness promotion throughout the life span.

10L. Practicum in Basic Concepts of Nursing Practice (2). Prerequisite: admission to the major; Nurs 10, 10S, 11 concurrently. Utilization of concepts from Nurs 10 in selected health wellness settings. Supervised practice of health assessment, communication skills and non-invasive nursing procedures. *CR/NC* grading only. (6 clinical hours)

10S. Basic Skills in Nursing I (1). Prerequisite: admission to the major; Nurs 10, 10L, 11 concurrently. Application of concepts from Nurs 10 in simulated client situations, emphasis on assessment and interventions required to assist individuals in meeting their common health needs. *CR/NC* grading only. (3 clinical hours)

11. Professional Issues (1). Prerequisite: admission to the major; Nurs 10, 10L, 10S concurrently. Basic overview of professional issues influencing nursing from historical perspective, nursing practice and the evolving health care system. Current theories, trends, and cultural, ecological, ethical, legal and political issues related to nursing practice.

110. Basic Concepts in Nursing II (4). Prerequisite: Nurs 10, 10L, 10S, 11; Micro 20, CFS 38; Nurs 110L, 110S, 111 concurrently. Integration of basic pathophysiology, pharmacotherapeutics, and assessment of clients across life span with emphasis on primary and secondary interventions, utilization of nursing process in care of clients with common health deviations.

110L. Practicum in Basic Concepts of Nursing II (3). Prerequisite: Nurs 110, 110S, 111 concurrently. Application of nursing process to clients with common health deviations. Identify risk factors associated with stressors and formulate nursing measures directed toward primary and secondary interventions. *CR/NC* grading only. (9 clinical hours)

110S. Basic Skills in Nursing II (1). Prerequisite: Nurs 110, 110L, 111 concurrently. Integration of knowledge and skills necessary for application in specific nursing diagnostic areas; emphasis on understanding the principles underlying the techniques and procedures required by clients with common health deviations. *CR/NC* grading only. (3 clinical hours)

111. Clinical Issues I (1). Prerequisite: Nurs 10, 10L, 10S, 11; Nurs 110, 110L, 110S concurrently. Clinical issues/problems relative to care of clients across the life span. Enhances the socialization of students by discussion/analysis of issues that influence nursing care of individuals.

120. Nursing the Childbearing Family (2). Prerequisite: Nurs 110, 110L, 110S, 111; Nurs 120L, 121, 121L, and 122 concurrently. Theoretical base and clinical knowledge for build-

ing and application in primary and secondary prevention in the nursing of the childbearing family. (Former Nurs 101)

120L. Clinical Practice in Nursing of the Childbearing Family (2). Prerequisite: Nurs 120 concurrently. Application of knowledge and technical skills in the nursing of the childbearing family during the intrapartum and postpartum periods with emphasis on the family as a unit. *CR/NC* grading only. (Former Nurs 101L)

121. Nursing Care of the Emotionally Disturbed Client (2). Prerequisite: Nurs 110, 110L, 110S, 111; Nurs 120, 120L, 121L and 122 concurrently. Current theories and concepts in the care of clients with behaviorial and emotional disturbances. (Former Nurs 104)

121L. Clinical Practice in Nursing of the Emotionally Disturbed Client (3). Prerequisite: Nurs 121 concurrently. Application of the nursing process to clients demonstrating major behavioral and emotional disturbances. *CR/NC* grading only. (Former Nurs 104L)

122. Clinical Issues II (1). Prerequisite: Nurs 110, 110L, 110S, 111; Nurs 120, 120L, 121, 121L concurrently. Clinical issues relative to maternal child and mental health nursing with focus on the psychological considerations of clients within the family structure.

130. Concepts of Acute Illness in Adults (2). Prerequisite: Nurs 120, 120L, 121, 121L, 122; Nurs 130L, 131, 131L concurrently. Secondary prevention of the acutely ill adult client/family with alterations in structure, energy and resources due to intra/inter and extrapersonal stressors upon flexible and normal lines of defense. Emphasis on the nursing process for reconstitution. (Former Nurs 102)

130L. Clinical Practicum: Acute Illness in Adults (3). Prerequisite: Nurs 130 concurrently. Application of nursing process in secondary prevention and care of acutely ill adults. *CR/NC* grading only. (Former Nurs 102)

131. Nursing of the Childrearing Family (2). Prerequisite: Nurs 120, 120L, 121, 121L, 122; Nurs 130, 130L, 131L concurrently. Introduction to current theories and concepts in the care of the pediatric client/family with emphasis on wellness and illness. (Former Nurs 100)

131L. Clinical Practice in Nursing of the Childrearing Family (3). Prerequisite: Nurs 131 concurrently. Application of specific skills, theories and concepts in the care of the pediatric client/family with emphasis on wellness and illness. *CR/NC* grading only. (Former Nurs 100L)

135. Professional Transition (3). Prerequisite: admission to the major with advanced standing. Introduction to theoretical and conceptual frameworks in nursing. Application to individual nursing practice. Opportunities for peer group support. Socialization into a BSN program. (Former Nurs 180T section)

136. Health Appraisal (3). Health appraisal integrates psycho-social and patho-physiological processes including techniques of history taking and health assessment in nursing practice and knowledge of normal findings as well as common deviations. (2 lecture, 2 lab hours)

137. Teaching Strategies for the Health Care Client (2–3). Prerequisite: upper-division status. Exploration of nurses' role as a teacher in health care setting. Principles of teaching and learning applied to teaching of individuals and groups. Opportunities for microteaching are provided. (Laboratory optional) (Former Nurs 220)

140. Concepts of Complex Clinical Nursing (2). Prerequisite: Nurs 130, 130L, 131, 131L; Nurs 140L, 141, 141L, 141S, 145 concurrently. Theory and concepts relative to care of clients with complex health problems. Emphasis on synthesis of concepts and principles derived from nursing and other disciplines in implementation of primary, secondary, and tertiary prevention for clients of all ages. (Former Nurs 103)

140L. Practicum in Complex Clinical Nursing (2). Prerequisite: Nurs 140 concurrently. Clinical application of concepts and nursing process in care of clients of all ages with complex health problems. (Former Nurs 103L)

141. Concepts in Community Health Nursing (2). Prerequisite: G.E. Division 9: Other Cultures; Political Science 2 or 101; Nurs 130, 130L, 131, 131L; Nurs 140, 140L, 141L, 141S, 145 concurrently. Introduction to the philosophy, principles and practice of community health nursing. Concepts and methods reflect a holistic perspective of man and the environment; understanding of the nursing process as applied to the community. (Former Nurs 128A)

141L. Practicum in Community Health Nursing (3). Prerequisite: Nurs 141, 141S, 145 concurrently. Application of primary, secondary and tertiary prevention in the community with individuals, families and groups. (9 clinical hours) (Former Nurs 128AL)

141S. Activities in Community Health Nursing (1). Prerequisite: Nurs 141, 141L concurrently. Discussions and presentations of the implementation of primary, secondary and tertiary nursing prevention in the community with individuals, families and communities. (3 clinical hours)

145. Nursing Theories and Research (3). Prerequisite: statistics, Nurs 130, 130L, 131, 131L; Nurs 140, 140L, 141, 141L, 141S concurrently. Application of nursing theories and the research process to nursing practice are explored. Focus includes historical evolution of contemporary theories in nursing, critique of current research and computer applications to research. (Former Nurs 125)

150. Concepts of Leadership and Role Development (4). Prerequisite: Nurs 140, 140L, 141, 141L, 141S, 145; Nurs 150L, 151 concurrently. Synthesis of concepts basic to development of a nurse generalist; emphasis on leadership and management skills; provides conceptual base for continuing professional development. (Former Nurs 106, 128B)

150L. Practicum in Leadership and Role Development (4). Prerequisite: Nurs 150 concurrent. Development of leadership/management skills and role development. Care of selected population of clients in a variety of care settings. (12 clinical hours) (Former Nurs 106L, 128BL)

151. Senior Project (2). Prerequisite: Nurs 140, 140L, 141, 141L, 141S, 145; Nurs 150, 150L concurrently. Opportunity for students to build upon conceptual, theoretical and research knowledge base. Students pursue in-depth study and practical application in areas of interest: management, conflict resolution, application of nursing theories, research or community project.

180T. Topics in Nursing (1–3 units; max total 12 if no topic repeated). Selected topics such as aging, holistic nursing, transcultural nursing, assertiveness training for nurses, psychosocial aspects of nursing, etc. Some topics may have clinical component.

185. School Nurse Seminar (3). Prerequisite: Nurs 136, Psych 168 or C D 114 or A S 111 and A S 115F; Admission to Health Services Credential Program. Role of nurse in school

health program; school health practice within legal/administrative parameters and effective use of resources.

186. School Nurse Practicum (3). Prerequisite: Nurs 137; A S 174 or A S 224; audiometrist certificate; Nurs 185 prior to or concurrently. School health services in elementary school; direct supervision by credentialed nurse required; scheduled conferences with preceptor and faculty. (9 clinical hours)

187. School Nurse Internship (3). Prerequisite: Nurs 137; A S 174 or A S 224, audiometrist certificate; Nurs 185 prior to or concurrently. Provide full range of school health services in secondary school; supervision by credentialed nurse required. Participate in special projects. Periodic conference with preceptor and faculty. *CR/NC* grading only. (9 clinical hours)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System.)*

210. Primary Care Techniques (2). Prerequisite: Nurs 136 or equivalent, pathophysiology, admission to the Graduate Program in Nursing. Refinement of interviewing, history taking and assessment skills. Primary care laboratory techniques and interpretation of laboratory findings. Health screening and selected secondary prevention strategies. Application of pathophysiology to the assessment process. Pharmacology for nurse practitioners.

223. Advanced Research Methodology in Nursing (3). Prerequisite: admission to Graduate Program in Nursing; statistics H S 92 or equivalent. In-depth study of research principles and techniques. A major requirement is the completion and submission of a research proposal.

224. Theories in Nursing (3). Prerequisite: admission to Graduate Program in Nursing. Selected nursing theories are described and evaluated. Theory construction, theory critique with comparative analysis of extant nursing theories, the relationship between theory and research, and the utility of nursing theory for practice, education and administration are explored.

225. Role Transitions in Nursing (2). Prerequisite: Nurs 228, 229. Emerging trends and universal aspects of advanced roles in nursing are examined. Appropriate theory, research and evaluation strategies are interpreted and applied to nursing practice, education and administration. Concepts of collaboration, consultancy, teaching, leadership and research are emphasized. (Former Nurs 261)

226. Analysis of Nursing Issues (2). Prerequisite: admission to Graduate Program in Nursing. The evolution of major issues relevant to nursing are analyzed within the context of social, political, economic and historical perspectives. Dialectic debate is utilized to facilitate critical thinking on current and emerging issues in nursing.

228. Seminar in Advanced Clinical Nursing (3). Prerequisite: Nurs 224. Conceptual models of family and community systems are analyzed in relation to health promotion, restoration and maintenance. Neuman's Health Care Model is evaluated in conjunction with other theories. Epidemiological and ecological frameworks with implications for primary, secondary and tertiary nursing interventions are addressed. (Former Nurs 201)

When I was a student at CSUF, I had no idea I would someday be a college professor myself. Without that exposure to higher education, I would obviously not have been competitive for the position I hold today.

Margo R. Zink, R.N., Ed.D.
Alumna from Connecticut
Nursing Educator

229. Practicum in Advanced Clinical Nursing (3). Prerequisite: Nurs 224, Nurs 210 (for Nurse Practitioner students). Prerequisite or corequisite: Nurs 228. Applications of individual, family, and community systems theories and health appraisal skills in clinical practice settings. Transcultural and intergenerational factors are addressed. Creative strategies to client systems problem solving are implemented through application of theoretical models across interdisciplinary practice settings.

230. Seminar in Nursing Education (3). Prerequisite or corequisite: Nurs 224. Analysis of educational issues in nursing; theories and methods of teaching in classroom and clinical instruction. (Former Nurs 231)

232. Curriculum Development in Nursing (3). Prerequisite or corequisite: Nurs 224; A S 227. Analysis of basic curricular concepts, theories and philosophies in designing nursing curricula. Incorporation of Neuman's Health Care Model and other nursing theories with nursing curricula are examined. (Former Nurs 222)

234. Practicum in Nursing Education (4). Prerequisite: Nurs 224, 228, 229; A S 227. Prerequisite or corequisite: Nurs 230. Implementation of a philosophy of nursing education and teaching-learning strategies are required. Under the preceptorship of a master educator, the learner participates in all aspects of instructional design, planning, implementation and evaluation. (Former Nurs 264).

240. Professional and Legal Aspects of Health Care for the Nurse Executive (2). Prerequisite: admission to Graduate Program in Nursing. Professional standards, quality assurance regulations and legal concerns related to executive nursing management are examined. Emphasis is on assisting the student in developing strategies for nursing executive decision making and problem solving.

242. Seminar in Nursing Administration (2). Prerequisite or corequisite: Nurs 224. Principles and practices related to executive nursing management and marketing of health care organizations are identified. Human and financial resources management in health-care organizational systems is examined. Advanced management concepts relevant to the nurse executive manager are analyzed.

243. Practicum in Nursing Administration (3). Prerequisite: Nurs 224, 228, 229. Prerequisite or corequisite: Nurs 242, Bus 214. Application of principles related to nursing executive management and health care marketing. Human and financial resource management, knowledge of professional standards, quality assurance, and legal concerns related to executive nursing management are examined in a practicum setting. (Former Nurs 262)

250. Seminar in Clinical Specialization (2). Prerequisite: Nurs 224, 228, 229. Advanced concepts of individual, family and community theory are analyzed in relation to the health promotion and reconstitution process of dysfunctional individuals, families and communities.

251. Practicum in Clinical Specialization (4). Prerequisite: Nurs 224, 228, 229. Prerequisite or corequisite: Nurs 250. Application of advanced concepts of family behavior and community development in clinical practice settings. Family and group process theories are applied to nursing, client and staff groups. (Former Nurs 263)

265. Nurse Practitioner Role in Primary Prevention (1). Prerequisite: Nurs 210, 224. Prerequisite or corequisite: Nurs 228. Corequisite: Nurs 229. Theoretical base for primary prevention: health maintenance, health promotion, health screening, health teaching and anticipatory guidance for nurse practitioners. Case management techniques utilizing protocols/algorithms.

266. Nurse Practitioner Role in Secondary Prevention (2). Prerequisite: Nurs 228, 229, 265. Theoretical base of secondary prevention in primary care settings. Assessment and management of acute self-limiting conditions. Use and development of algorithms/protocols for secondary prevention. Intensive pharmacology for nurse practitioners.

267. Practicum in Secondary Prevention, Family Nurse Practitioner (4). Prerequisite: Nurs 228, 229, 265. Prerequisite or corequisite: Nurs 266. Supervised clinical practice in a primary-care setting with emphasis on secondary prevention for clients of all ages. Students work directly with preceptor and faculty member. Complete assessment and case management. (One hour clinical conference per week.)

269. Practicum in Secondary Prevention, Pediatric Nurse Practitioner (4). Prerequisite: Nurs 228, 229, 265. Prerequisite or corequisite: Nurs 266. Supervised clinical practice in a pediatric primary-care setting with emphasis on secondary prevention. Students work directly with a preceptor and faculty member. Complete assessment and case management. (One hour clinical conference per week.)

271. Practicum in Secondary Prevention, Geriatric Nurse Practitioner (4). Prerequisite: Nurs 228, 229, 265. Prerequisite or corequisite: Nurs 266. Application of knowledge related to management of acute, self-limiting and stable chronic conditions/families.

277. Family Nurse Practitioner Role in Tertiary Prevention (1). Prerequisite: Nurs 266, 267. Theoretical base for tertiary prevention for families in primary care settings. Assessment and management of chronic conditions requiring reconstitution. Development of protocols/algorithms for tertiary prevention. Integration of knowledge related to primary, secondary and tertiary prevention.

278. Practicum in Tertiary Prevention, Family Nurse Practitioner (3). Prerequisite: Nurs 266, 267. Prerequisite or corequisite: Nurs 277. Supervised clinical practice in a primary care setting with emphasis on care of clients of all ages requiring tertiary prevention. Students work directly with a nurse practitioner and/or physician preceptor in a primary care setting. (One hour clinical conference per week.)

279. Pediatric Nurse Practitioner Role in Tertiary Prevention (1). Prequisite: Nurs 266, 269. Theoretical base for tertiary prevention for children in primary care settings. Assessment and management of chronic conditions requiring reconstitution. Development of protocols/algorithms for tertiary prevention. Integration of knowledge related to primary, secondary, and tertiary prevention.

280. Practicum in Tertiary Prevention, Pediatric Nurse Practitioner (3). Prerequisite: Nurs 266, 269. Prerequisite or corequisite: Nurs 279. Supervised clinical practice in a primary care setting with emphasis on care of children requiring tertiary prevention. Students work directly with a nurse practitioner and/or physician preceptor in a primary care setting. (One hour clinical conference per week.)

281. Geriatric Nurse Practitioner Role in Tertiary Prevention (1). Prerequisite: Nurs 266, 271. Theoretical base for tertiary prevention for older adults in primary care settings. Assessment and management of chronic conditions requiring reconstitution. Development of protocols/algorithms for tertiary prevention. Integration of knowledge related to primary, secondary and tertiary prevention.

282. Practicum in Tertiary Prevention, Geriatric Nurse Practitioner (3). Prerequisite: Nurs 266, 271. Prerequisite or corequisite: Nurs 281. Supervised clinical practice in assessment and management of acute, self-limiting, and stable chronic conditions of individuals and families.

288T. Seminar: Topics in Advanced Clinical Nursing (1–3; max total 9). Prerequisite: permission of instructor. Selected topics in specialized practice domains such as home health, cardiovascular, oncology, gerontologic and rehabilitation nursing. Analysis and integration of research-based knowledge into the nursing process characterizing the specific practice domain are emphasized.

290. Independent Study (1–3; max total 3). See *Academic Placement — Independent Study.* Approved for *SP* grading.

298. Project (3). See *Criteria for Thesis and Project.* A project is defined as a systematic development of a plan for, or critical evaluation of, a significant undertaking or a creative work in nursing such as modularized curriculum and clinical protocols. Abstract required. Approved for *SP* grading.

299. Thesis (3). Prerequisite: See *Criteria for Thesis and Project.* Nurs 223. Preparation, completion and submission of an acceptable thesis, based on an approved proposal, for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

302T. Selected Topics in Nursing (1–6; repeatable with different topics). Selected topics related to recent developments and advances in the knowledge and techniques of nursing. The purpose is to offer nurses, health personnel, and others the opportunity to study in-depth the selected topics related to specific clinical areas of nursing.

PEACE AND CONFLICT STUDIES
Interdisciplinary Minor

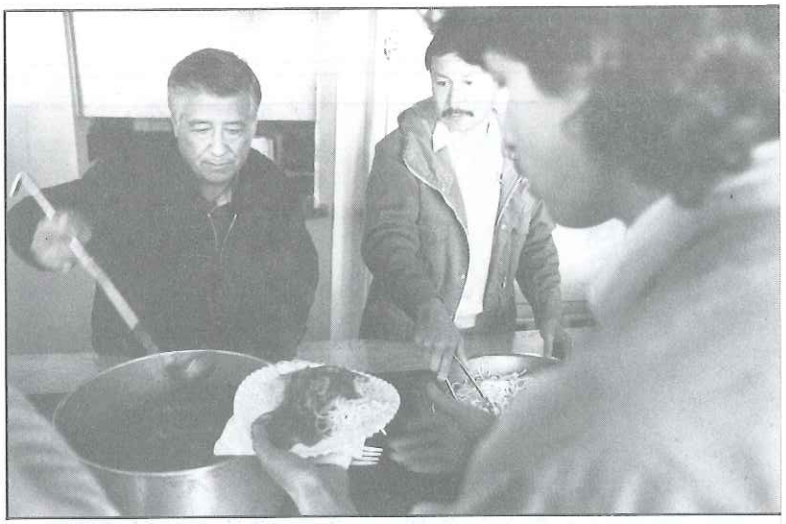
School of Social Sciences
Peter J. Klassen, Dean
Social Sciences Building, Room 109
(209) 278-3013

The overall purpose of the program in Peace and Conflict Studies (21-unit minor) is to prepare students, including potential leaders, with peacemaking and conflict management skills they can apply to daily-life situations, regardless of their academic disciplines or chosen professions. The program has been developed to provide an interdisciplinary perspective to the study of conflict, violence, war and peace. Such an approach is essential in view of the highly-complex, interconnected, interdependent world in which we live. This requires an understanding that allows people to respond creatively, rather than thoughtlessly, to conflict and violence at various levels. This interdisciplinary program is open to all students.

Faculty

Sudarshan Kapoor, *Program Coordinator*

Melanie Bloom, *Speech Communication*
Robert Fischer, *Sociology*
Bernard E. McGoldrick, *Political Science*
Robert Mikell, *Ethnic Studies*
Ernest Moerk, *Psychology*
Robert Valett, *Education*



Requirements for the Minor

A total of 21 units, which will include:

1. 15 units from the Areas of Study listed below. It is strongly recommended that 3 units be taken from each of the five Areas of Study. However, four out of the five areas must be covered.
2. Practicum or independent study in Peace and Conflict Studies (3 units). See program adviser for more information.
3. **IntD 180. Peace and Conflict (3).** Provides an overview of causes and types of conflict, critical examination of issues related to war, peace and justice; historical and contemporary perspectives and responses to conflict resolution; uses an eclectic and interdisciplinary approach. This is the program's only required course and provides an interdisciplinary foundation to the program. General Education CAPSTONE Interdisciplinary Course, Critical Thinking.

Areas of Study

AREA I — Personal and Interpersonal Issues

Soc 150T	Interpersonal Relationships
Soc 165	The Family
Spch 108	Communication and the Small Group
Spch 162	Interpersonal Communications
Phil 10	Self, Religion, and Society
Phil 157	Freedom, Fate, and Choice
Psych 61	Personal Adjustment
Psych 178	Culture, Social Class, and Development

AREA II — Community and Social Issues

Anth 172	Ethnic Relations and Cultures
Af Am 144	Race Relations
IntD 156	Military Expenditures
Crim 140	Family Violence
CLS 128	Contemporary Political Issues
Econ 140	Political Economy of the Military-Industrial Complex
I S C 93	Contemporary American Society (1 unit)
Soc 111	Society of Minority Relations
Phil 120	Contemporary Conflicts in Morals
Phil 125	Issues in Political Philosophy
Pl Si 116	Contemporary Political Ideology
Psych 134	Social Psychology
W S 108	Rape
W S 116	Domestic Violence

AREA III — International and Global Issues

Ag Ec 140	International Agricultural Development
Anth 142	Anthropology of War
B A 174	Introduction to International Business
Econ 114	Economic Development of Poor Nations
Econ 179	Global Corporations and the Third World
Geog 163	World Crisis
Hist 180	U.S. Military History
Pl Si 112	Christianity and Politics
Pl Si 120	International Politics
Pl Si 122	Contemporary World Politics
Pl Si 125	Soviet Foreign Policy
Psych 150T	Psychology of Peace and War
Soc 157	Social Change

AREA IV — Conflict Management

Ag Ec 117	Agricultural Labor-Management Relations
B A 108	Law and Society
B A 156	Labor Law
Hist 166	U.S. Latin American Diplomacy
Hist 184B	American Diplomatic History
HRM 152	Labor Relations and Collective Bargaining
Pl Si 8	Human Civil Rights
Pl Si 126	International Law and Organization
Pl Si 159T	Conflict Resolution
Spch 169	Communications and Conflict Management

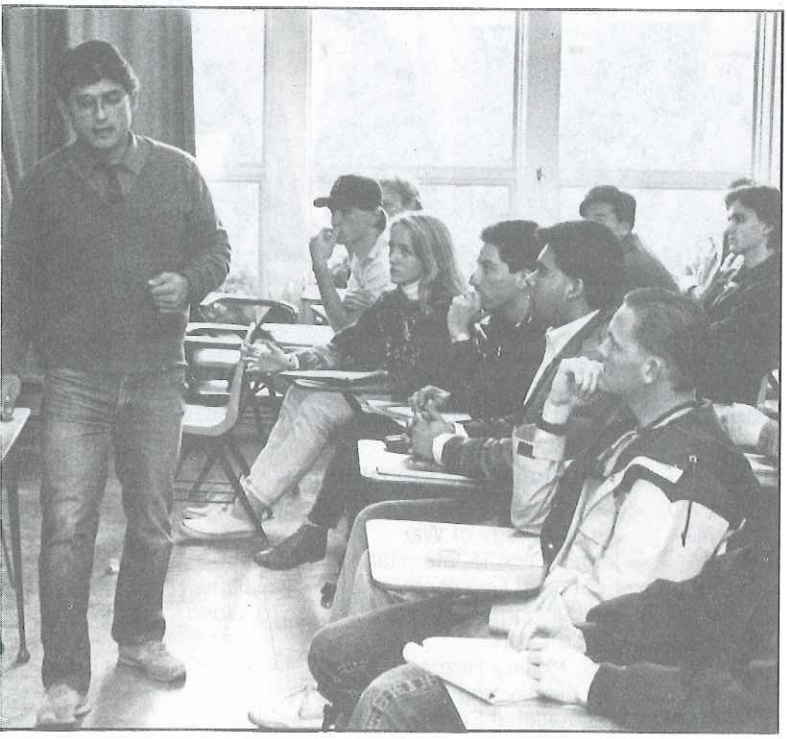
AREA V — Education for Peace and Nonviolence

Af Am 145	Martin Luther King Jr.
C R P 110T	Community Development
EHD 101	Peace Education
P E 111	The Olympic Games
Phil 131	Comparative Religion
Soc 122	Social Movements
S Wrk 122T	Gandhi and Nonviolence

Philosophy

School of Arts and Humanities
Department of Philosophy
Jack A Pitt, Chair
Peters Business Building
(209) 278-2621

B.A. in Philosophy
Options:
Pre-Law
Religious Studies
Minor in Philosophy



Philosophy is one of the fundamental domains of human thought. It grows out of basic life questions, including questions of ethics, religion, politics and science. The study of philosophy has had an historic role in the core of sound education, because it helps sharpen skills of careful, independent thinking and aids people of all ages in defining their most important values and beliefs. The examination of great philosophical ideas, and the emphasis on clear reasoning and personal development that are involved in philosophy serve as a strong foundation for life, regardless of one's career objectives.

The Department of Philosophy offers students the following opportunities for a rich and rewarding undergraduate experience: the traditional B.A. philosophy major, the religious studies option, the pre-law option and the philosophy minor. The department provides an ample opportunity for individual attention and student participation in its activities, e.g. Philosophy Club, symposia, etc. Students may also minor in philosophy.

Faculty and Facilities

The department has a diverse and well trained faculty with special interests ranging from logic and scientific method to Existentialism and philosophy of religion. All members of the department share the conviction that the best way to teach philosophy is through an intense but sympathetic interchange between the teacher and the student. Our conference room is a pleasant and frequently used meeting place for students and faculty.

Career Opportunities

The undergraduate major provides an excellent foundation for a variety of professional careers as well as for graduate study in philosophy. Law schools, seminaries and various governmental and business training programs emphasize the critical and communication skills required to complete a B.A. in philosophy. Thus, graduating majors are often in a competitive position for occupations that at first glance are not obviously related to the study of philosophy. In fact, people who have majors or minors in philosophy can be found in almost all areas of endeavor, from medicine, law and the ministry, to teaching, social work, and fine arts.

Faculty

Jack A. Pitt, *Chair*

Pedro Amaral
Karen R. Bell
Ann E. Berliner
Hague D. Foster
Warren L. Kessler
James W. Slinger
James M. Smith

Adviser: James W. Slinger
Pre-Law Option Adviser: Pedro Amaral
Religious Studies Option Adviser: Ann E. Berliner

Bachelor of Arts Degree Requirements
Philosophy Major

Units

1A. Philosophy Major Requirements 32
- a) Phil 25, 45 or 145 ..... (3–4)
- b) Phil 101 and 103 ..... (6)
- c) Select 2: Phil 105, 146, 150, 156, 157 or approved 159T ..... (6)
- d) Select 1: Phil 115, 118 or approved 119T ..... (3)
- e) Select at least 2: Phil190 and/or 192 ..... (3)
- f) Phil 170T ..... (3)
- g) Approved philosophy electives ..... (7–8)

1B. Philosophy Major — Religious Studies Option Requirements 32–33

The department has prepared a special program for those who wish to engage in a combined study of philosophy and religion. This Option emphasizes the comparative and ecumenical study of religion. Students with a general interest in religion might consider this option. Those who wish to pursue a religious vocation or do graduate work in religious studies will find it especially valuable.
- a) Phil 25, 45, or 145 ..... (3–4)
- b) Phil 130, 131 ..... (6)
- c) Phil 133W and/or 134 ..... (3–7)
- d) Phil 136, 137, 138 ..... (3–6)
- e) Phil 172T or 170T ..... (3)
- f) Select 1: Phil 101, 103, 105, 107 ..... (3)
- g) Select 1: Hist 103A–B, Hist 116, Anth 150W or other approved courses outside the philosophy department ..... (3)
- h) Phil 190, 192 or approved philosophy electives ..... (3–4)

1C. Philosophy Major — Pre-Law Option Requirements..37–38
The Pre-Law Option emphasizes critical thinking and analytical skills, as well as ethics and issues related to law. It also includes a law-related intern experience. Law schools do not prefer any specific major, but emphasize critical thinking and general education. (See Preprofessional Preparation). Students with a strong interest in philosophy as well as law may find this option valuable. Depending upon the interests of the student, courses or minors in political science, business, criminology and a variety of social sciences would be useful electives to the Pre-Law Option.
a) Select 1: Phil 25 or 45 ..... (3–4)
b) Select 1: Phil 101 or 103 ..... (3)
c) Select 1: Phil 115 or 118 ..... (3)
d) Select 1: Phil 120 or 122 ..... (3)
e) Select 1: Phil 121 or 127 ..... (3)
f) Select 2: Phil 146, 150, 156 or 157 ..... (6)
g) Phil 170T ..... (3)
h) Phil 199 ..... (4)
i) Electives: Anth 146; B A 108; Crim 20, 21; Eth S 146; Pl Si 70, 110, 111, 170, 171 or other approved courses outside the department ..... (9)

2. General Education requirements 51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a dual major or minor 35–47*

Total 124

* This figure takes into consideration that two philosophy courses (6 units maximum) may also be applied to satisfy General Education requirements, as follows: CORE, Critical Thinking — Phil 25 or 45 (3 units); and BREADTH, Division 6 — Phil 1, 10, 120, or 131 (3 units). (See *General Education.*) Consult the department chair or faculty adviser for details.

Notes:

1. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy philosophy major or philosophy — religious studies major requirements.
2. *CR/NC* grading is not permitted in courses used to fulfill the philosophy major requirements.
3. General Education and elective units may be used toward a dual major or minor (see *Dual Major* or departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.
4. Students intending to pursue graduate study in philosophy, law or religious studies should seek a faculty adviser's help in planning adequate preparation.
5. Visit the Philosophy Department Office or your faculty adviser for the list of approved *T* classes for the major.

Philosophy Minor

The minor in philosophy consists of 16 units in philosophy, of which at least 6 units must be upper division.

COURSES

Philosophy (Phil)

1. Introduction to Philosophy (4). Introduction to the basic issues, disputes and methods of traditional and contemporary philosophy, including theory of knowledge, ethics, metaphysics, religion and social theory. Development of skills in analysis, logical thinking and self-expression. General Education BREADTH, Division 6. (CAN PHIL 2)

10. Self, Religion, and Society (3). Conceptions of human nature; nature and varieties of religion; personal and social implications and values of religion. General Education BREADTH, Division 6.

25. Methods of Reasoning (4). Principles and methods of valid inference. Typical topics: forms of deductive inference, basic types of inductive inference, common pitfalls in moral reasoning, problems in reasoning due to the nature of language, and common fallacies found in arguments in everyday life. General Education CORE, Critical Thinking.

26. Reasoning and Religion (4). An introduction to principles and methods of critical thinking utilizing as source material the claims, arguments and theories of major Western and non-Western religious traditions. Not open to students who have had Phil 25 or 27. General Education CORE, Critical Thinking.

27. Reasoning About Values (4). An introduction to principles and methods of critical thinking, utilizing as source material claims and arguments concerning values, ethics, social and political issues. Not open to students who have had Phil 25 or 26. General Education CORE, Critical Thinking.

45. Elementary Formal Logic (4). Basic concepts and methods of logic; emphasis on deduction. Development of skills in utilizing the power and precision of formal techniques to evaluate the worth of reasons and evidence, viz., elementary symbolic logic for deduction; elementary probability theory for induction. General Education CORE, Critical Thinking. (CAN PHIL 6)

101. Ancient Philosophy (3). Development of Western Philosophy from its beginning; the emergence of critical theory, doctrines and schools of thought in Greek and Roman culture. Topics considered may include: "pre-Socratic" philosophy; the work of Plato and Aristotle; Epicurus and the Atomists; Stoicism. General Education CAPSTONE Cluster, Critical Thinking.

103. Bacon to Kant (3). Development of early modern philosophy: the search for new scientific methods — Bacon, Descartes, Spinoza, Newton and Locke; empiricism and skepticism — Berkeley and Hume; rationalist metaphysics — Leibniz; influences on moral and political thought — the Enlightenment; Rousseau; Kant's critical philosophy. General Education CAPSTONE Cluster, Critical Thinking.

105. Twentieth Century Philosophy (3). Principal developments in philosophy after 1900. Figures and movements include: logical atomism, logical positivism, linguistic analysis, pragmatism, phenomenology, existentialism, G. E. Moore, Russell, Wittgenstein, Whitehead, Dewey, Santayana, Husserl, Heidegger, Sartre, Austin, Ryle, Strawson, Carnap, Ayer.

106T. Topics in History of Philosophy (1–3; max total 9 if no topic repeated). Consideration of special historical issues or individual philosophers.

107. Existentialism (3). Examination of roots of existentialism in Kierkegaard and Nietzsche; study of such 20th century existentialists as Sartre, Heidegger, Jaspers, Buber. Typical problems examined: nature of mind, freedom, the self, ethics, existential psychoanalysis.

108. Roman Philosophy (3). Study of major figures and schools of philosophy in the Roman world. Special emphasis upon Epicurean, Stoic, and Skeptic traditions, with consideration of other major contributions. General Education CAPSTONE Cluster, Critical Thinking.

115. Ethical Theory (3). Introduction to the fundamental concepts and problems of moral theory. Examination of various ethical theories, including relativism, egoism, utilitarianism, intuitionism and non-cognitivism; the meaning of ethical terms.

118. Social and Political Theory (3). Examination of traditional and contemporary theories of society and government. Analysis of basic concepts such as the common good, social contract, authority, justice and natural rights.

119T. Topics in Valuation and Obligation (1–3; max total 9 if no topic repeated). Investigations of selected topics in ethics, value theory, political and social philosophy, aesthetics.

120. Contemporary Conflicts of Morals (3). (Same as A Eth 100.) Introduction to ethical theory and its application to contemporary moral problems. Discussion to include: business ethics, medical ethics, sexual morality, abortion, mercy killing; pot, drugs and alcohol; crime and punishment, civil disobedience, revolutionary violence, rights of women and minorities. General Education BREADTH, Division 6.

121. Ethics in Criminal Justice (3). Philosophical issues concerning society's treatment of criminal behavior. Topics discussed include: what types of deviant behavior should be regarded as criminal?, morality and law; punishment or rehabilitation; safe vs. repressive society.

122. Introduction to Professional Ethics (3). (Same as A Eth 101.) Survey of ethical issues and standards facing a range of professionals in their careers, including engineering, law, medicine, the media, science, agriculture, education and business. Introduction to basic ethical theories and methods of reasoning about moral dilemmas.

125. Issues in Political Philosophy (3). Not open to students who take Phil 118. Examination of prominent political philosophies and contemporary issues of politics and public policy. Policy issues may include the scope and limits of government authority, the role of government in the economy, foreign policy, health care, education, agriculture and the environment. General Education CAPSTONE Cluster, Critical Thinking.

127. Philosophy of Law (3). Nature and functions of law; methods of justifying legal systems; logic of legal reasoning; analysis of fundamental legal concepts.

129. Marxism (3). Examination of basic ideas of Marx inherent in his writings and a consideration of later developments now called "Marxist."

130. Philosophy of Religion (3). The nature and function of religious faith, belief and practice; relations between religion and morals; existence of God; problem of evil; nature and significance of religious experience. General Education CAPSTONE Cluster, Critical Thinking.

131. Comparative Religion (3). Survey of the major religions of mankind, their history and teachings, with emphasis on Hinduism, Buddhism, Confucianism, Taoism, Judaism, Christianity, and Islam. General Education BREADTH, Division 6.

133W. Literature of the New Testament (3). (Same as Engl 115W.) Prerequisite: Engl 1. Discussion and close written analyses of selected texts from the New Testament. Meets upper-division writing skills requirement for graduation.

134. Literature of the Old Testament (4). (Same as Engl 116.) Discussion and written analyses of selected texts from the Hebrew Bible. Special attention to the sources and styles of biblical literary techniques. General Education CAPSTONE Cluster. (Former Phil 134W)

136. Buddhism (3). Introduction to Buddhism. Life and teachings of Gautama Siddhartha Buddha; development of Buddhism after death or mahanirvana of the Buddha.

137. Hinduism (3). Introduction to the development and ideas of Hinduism.

138. Chinese Thought (3). Classical religions, ethical and political thought, in ancient China; probable emphasis on Confucianism and Taoism.

139T. Topics in Religious Issues (1–3; max total 9 if no topic repeated). Investigations of selected topics in philosophy of religion and comparative religion.

145. Symbolic Logic (3). (Similar to Math 110; consult department.) Prerequisite: Phil 25 or 45 or consent of instructor. Theory of deductive inference; includes propositional logic, predicate logic, relations, identity, definite description, nature of axiom systems.

146. Philosophy of Language (3). Nature and uses of language; theories of meaning; concepts of reference, predication, truth, name, ambiguity, vagueness, definition, metaphor; relationships between methodology in philosophy and theories of language.

150. Foundations of Knowledge (3). Nature, sources, and limits of human knowledge; roles of perception, reason, memory, authority, and intuition in the justification of beliefs in all areas; for example: science, math, ethics, religion, the past, other minds. General Education CAPSTONE Cluster, Critical Thinking.

156. Philosophy of Mind (3). Analysis of problems concerning the nature of mind and mental phenomena: relation between mind and body, nature of the self and personal identity, free will, action and behavior, thinking machines, knowledge of other minds; concepts of mind, intention, desire, emotion.

157. Freedom, Fate, and Choice (3). Nature of human action, free will and determinism, free will and moral responsibility; analysis of basic concepts; for example, will, action, freedom, determinism, fatalism, chance, choice, decision, intention, reason, desire, belief; implications for everyday life.

159T. Topics in Logic, Epistemology, and Metaphysics (1–3; max total 9 if no topic repeated). Investigations of selected topics in logic, epistemology, and metaphysics.

165T. Special Topics (1–3; max total 9 if no topic repeated). Topics of current or interdisciplinary interest or requiring special background.

170T. Senior Seminar (1–4; max total 12 if no topic repeated). Prerequisite: senior standing or permission of instructor and at least one upper-division philosophy course. Intensive investigation of selected problems, major figures, or a historical period in philosophy. Extensive writing and supervised research.

172T. Seminar in Religious Issues (1–4; max total 12 if no topic repeated). Prerequisite: one upper-division philosophy course. Intensive investigation of problems in philosophical theology, comparative religion, and culture. Extensive writing and supervised research.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

192. Directed Reading (1–3; max total 6). Prerequisite: permission of instructor. Supervised readings in a selected philosopher or field of philosophy. Combined units of Phil 190 and 192 may not exceed 6 units.

199. Fieldwork in Philosophy and Law (4–6). Prerequisite: senior standing, permission of instructor. Practical community workstudy experience in legal or paralegal setting. Student works under sponsorship of law firm or law-related agency. Meets periodically with instructor, submits written report on relevant issues in ethics, jurisprudence or philosophy.

Physical Education and Human Performance

School of Health and Social Work
Department of Physical Education and Human Performance
Joanne W. Schroll, Chair
South Gym, Room 111
(209) 278-2016

B.S. in Physical Education
Options: Adapted, Allied Career, Athletic Training, Teaching
MINORS:
Physical Education
Coaching
CERTIFICATE:
Aerobic Leadership
M.A. in Physical Education
Option: Exercise Science
Single Subject Teaching Credential in Physical Education
Adapted Physical Education Specialist Credential
Athletic Trainer Certification

The Department of Physical Education and Human Performance has the unique opportunity to contribute to one's overall physical fitness by providing experiences that develop cardiovascular endurance, strength, flexibility and relaxation. Concomitant contributions are in the areas of skill acquisition, scientific knowledge, and worthy use of leisure time.

The curriculum for the B.S. degree in physical education is designed to meet individual professional goals. The flexibility of the program provides for the preparation of: physical education teachers, coaches, professionals in various fields related to physical education, athletic trainers, and advanced study and research.

The emphasis in athletic training allows students to become involved in a growing and successful program. Upon completion of the program the student is eligible for certification by the National Athletic Trainer's Association. The program has high academic and performance standards that include a minimum of 1,800 hours of field work in a two-year internship program. The internship includes working in one of the training rooms where service is provided for all 18 intercollegiate sports offered within the athletic program. Students interested in this program must consult the athletic trainer adviser.

The Master of Arts degree program in physical education is designed to provide advanced study for the purpose of extending competence in the areas of science, theory, leadership and research techniques. Class size and format accommodates individual attention and student interaction with other students and faculty.

Career Opportunities

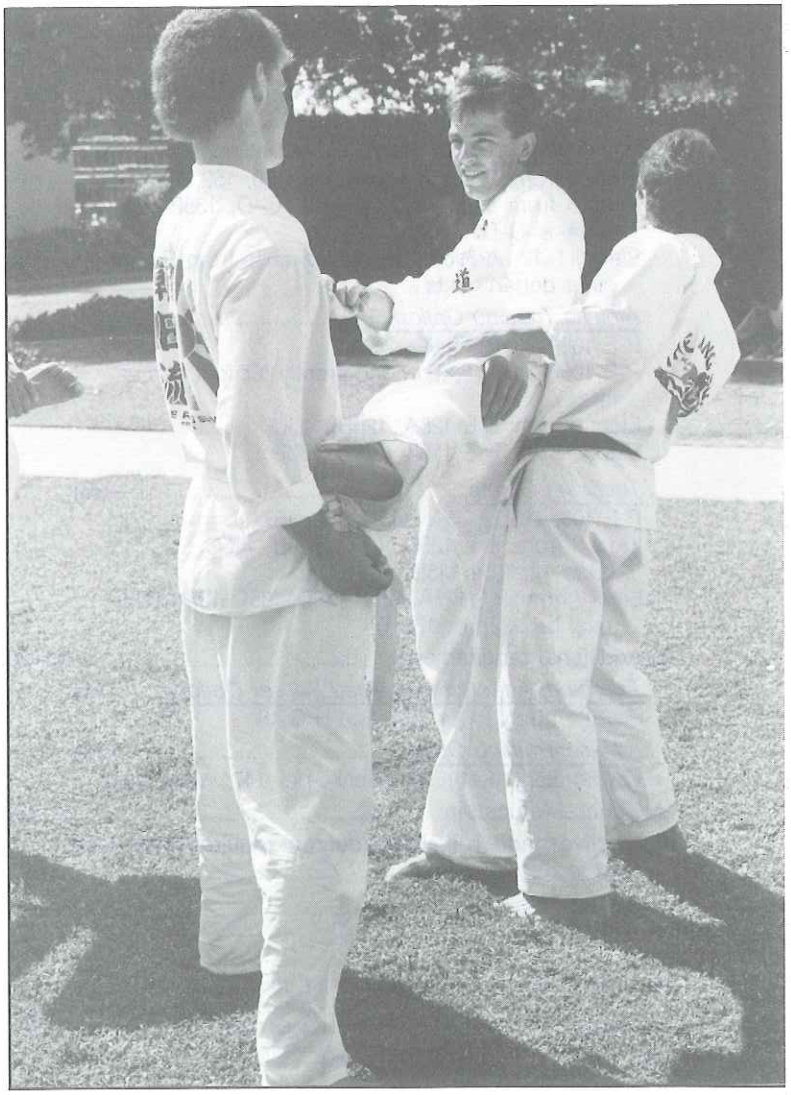
Historically, a graduate with a degree in physical education was employed as a teacher and/or coach in a school setting. In recent years, however, a variety of career opportunities has emerged for the physical education major. With increasing frequency, commercial, industrial and government entities are becoming employers of physical education majors. Aquatics centers, racquet clubs, dance studios, wellness and fitness centers, sports medicine clinics, agencies for the handicapped and rehabilitation centers are some examples. Fitness and movement instruction for preschool youngsters and the elderly are other possible career opportunities. Physical education majors with certification in athletic training have opportunities with professional teams and in private enterprise, in addition to the traditional educational setting.

Activity Classes

A broad variety of activities for differing ability levels is offered for students interested in physical activity. The program is developed to aid students interested in gaining physical skills and/or fitness. Activity courses are offered in aquatics, recreational dance, individual activities and team sports. Unique experiences are provided in areas such as back packing, bicycling, fencing, karate, skiing and yoga as well as in the more traditional activities. Individualized instruction is available for all students including those with physical limitations.

Facilities

The facilities for physical education include two gymnasiums, six racquetball/handball courts, 12 tennis courts, a large matted area, a gymnastic apparatus area, a strength-training area, an all-weather track, multipurpose fields for softball, football, soccer and golf, an archery range, a swimming pool, dance room, exercise physiology lab and athletic training room.



Faculty

Joanne W. Schroll, *Chair*

Tim R. Anderson
Sally L. Ayer
O. Duane Ballard, Jr.
Rhita Flake
Richard W. Francis
Ara Hairabedian
Melva E. Irvin
Rose M. Lyon
Mary L. Mott
Leilani Overstreet
Donna R. Pickel
Billie L. Poston
Patricia L. Thomson
Robert B. Van Galder
R. Jack Wilcox

Undergraduate Adviser: Consult Department Chair
Graduate Adviser: Pat L. Thomson
Credential Adviser: Melva E. Irvin
Athletic Trainer Adviser: Edward L. Ferreira
Adapted Adviser: Rose M. Lyon

Bachelor of Science Degree Requirements
Physical Education Major

	Units
1. Major requirements	53
Core Program (Required for all options)	(24)
P E 30, 31, 115K, 147, 153, 156A–B, 159A	
Option (Select one):	(29)
Adapted Option	(29)
P E 115D, 125C, 135E or 135H, 145A, 145B or 145C, 145D or Dance 160, P E 150, 152, 157A, 159B	
Allied Career Option	(29)
Elect 3 from: P E 106A, 108, 146, 150, 152, 162	
Elect 3 from: P E 115D, 125A–B–C–D, 135B–E–H, 145A–B–C–D	
Elect 11–12 additional approved units from P E or other departments	
Athletic Training Option	(29)
P E 106A, 106B, 106C; 157A	
P E 106D, 107 (taken concurrently for four semesters)	
Elect 2 from: P E 125A, 125B, 125D	
Elect 1 from: P E 115D, 125C, 135B	
Teaching Option	(29)
P E 108, 115D, 145A, 145D, 152, 157A	
Elect 2 from: P E 125C, 135B, 145B, 145C (One must be 145B or 145C)	
Elect 2 from: P E 125A, 125B,125D; 135E, 135H (One must be 135E or 135H)	
2. Additional requirements	11–20
Teaching, Adapted and Allied Career Options	(11)
Phy 33; FScN 54 or 147; and H S 48	
Athletic Training Option	(20)
Phy 64, 65; H S 48, 90; FScN 54 or 147; Psych 102	
3. General Education	51
4. Electives and remaining degree requirements (see *Degree Requirements.*)	0–9*
Total	124

* This figure takes into consideration that P E 31 or H S 90 may also be used to satisfy the General Education BREADTH, Division 4 requirement and that Psych 102 may be used toward partial fulfillment of the General Education CAPSTONE, Juveniles and Adolescence cluster requirement. Consult department chair or faculty adviser for details.

Notes

1. Mandatory advising is required of all students in this degree program. See the department chair for the name of your assigned adviser.
2. With the assistance of the departmental adviser students may choose a sequence of courses which will prepare them for working with specific age groups or special populations, coaching, athletic training, teaching physical education or allied careers.
3. Each student must pass a series of physical performance tests administered by the department in order to complete the major or to be admitted to the teaching credential program. Specific information regarding tests may be obtained from the department office, South Gym, Room 111.
4. Prerequisite skill tests are required for the following courses: P E 115D, 135H, 145A, 145B, 145C, 145D.
5. Students majoring in physical education may count a *maximum* of 12 units of activity courses (ATHL, PE AC, Dance) toward the 124 units required for a Bachelor's Degree in Physical Education and Human Performance.
6. *CR/NC* grading is not permitted in courses for the physical education major, including "additional requirements."
7. General Education and elective units may be used toward a minor (see departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.
8. Completion of the Bachelor of Science degree in the physical education teaching option meets the requirements of the Single Subject Waiver program.
9. Students interested in the athletic training option should consult the department for the criteria for selection into this program.
10. See department adviser regarding senior major requirements.

Physical Education Teaching Credential Requirements

	Units
Single Subject Credential in Physical Education	161
B.S. Degree with Major in Physical Education Teaching Option	124
Teacher Education Courses	37
Adapted Physical Education Specialist Credential	170
B.S. Degree with Major in Physical Education Adapted Option	124
Courses in Addition to the Major to be Completed Prior to Student Teaching	
P E 146, 157B, 158A-B	(9)
Teacher Education Courses	37

Notes

1. Students interested in obtaining a teaching credential are strongly advised to confer with the physical education and human performance department credential adviser at the beginning of the junior year.
2. Students must apply and be admitted to the School of Education and Human Development to begin education requirements. For prerequisites and other admission requirements, see the Single Subject Credential program as listed under the teacher education department.
3. To complete the major or to be admitted to the credential program, each student must pass a series of physical performance tests and all skill competency tests administered by the physical education and human performance department.

4. The required courses, or their approved equivalents, in the B.S. degree and credential programs must be completed by all single subject credential candidates.
5. Verification that the waiver program has been completed and a recommendation for admission into the professional preparation program are the responsibility of the department credential adviser. These may be granted only after the prescribed B.S. degree waiver program has been completed.

Physical Education and Human Performance Minor and Certificate Requirements

	Units
Physical Education Minor (satisfies Add-on credential)	20–21
P E 31, 105	(6)
P E 108, 115K, 147, 152, or 159A	(3–6)
P E 115D, 125C, 135B, 145A, 145B,145C or 145D.	(3–6)
P E 135E, and/or 135H	(3–6)
Coaching Minor	23
P E 105, 106A, 115K, 162, FScN 54 or FScN 147	(15)
P E 115D, 125A, 125B, 125C, 125D, 135B, 135H, 145A, or 145B	(6)
Coaching Internship (P E 199-approved by Dept. Chair)	(2)
Certificate of Aerobic Leadership	18
P E 105, 115K, 180T, Rec 168	(11)
P E 106A, H S 48, or FScN 54 or FScN 147	(3)
PE AC 21, 24, 124, 103, Dance 155A	(2)
P E 199 Supervised Work Experience	(2)

Notes

1. Students should consult with an adviser regarding any of the above programs.
2. CPR certification is required of all students completing a minor or certificate program.

Master of Arts Degree Requirements

The Department of Physical Education and Human Performance offers advanced study designed to enhance professional competencies in teaching, administration and research in physical education. Students may follow the current program designed for the teacher-practitioner or select options which lead to specialized degrees.

Requirements. The Master of Arts degree requires 30 units of advanced coursework of which there is a common core of 9 units, 15–18 units of specific curricular requirements and 3–6 units of electives. The culminating experience may be a thesis, a comprehensive exam or an internship.

Under the direction of a graduate adviser, each student designs a coherent program within the following framework:

M.A. in Physical Education

	Units
Core	
P E 230, 231, and 261	9
Requirements	
P E 223, 242, 260, 262, and 263	15
Electives	
P E 298 (6) or P E 299 (3–6) or one-two of the following: P E 222, 233, 234, 240, 241, 290 or approved outside area courses	6
Total	30

Exercise Science Option

	Units
Core	
P E 230, 231, and 261	9
Requirements	
P E 222, 223, 233, and 234	12
Electives	
Any P E 200-level course or any approved outside area course	3
Thesis	
P E 299	6
Total	30

Notes

1. The Master of Arts degree program in physical education assumes undergraduate preparation equivalent to a CSU, Fresno major in physical education.
2. All students must take a departmental written screening examination before advancement to candidacy. The university writing skills requirement is included in the screening examination.
3. See also the general graduate requirements listed under the *Division of Graduate Studies and Research.*

COURSES

Note: Activity courses may be repeated for credit. Students may apply a maximum of eight units to the total degree requirements.

Aquatics (PE AC)

4. Swimming for Beginners (1). (Former PE AC 104)

101. Advanced Lifesaving (2). Prerequisite: 500 yard swim in 10 minutes or less.

103. Swim for Fitness (1). Prerequisite: Intermediate swim ability.

107. Water Safety Instructor Course (2; not repeatable for credit). Prerequisite: 500 yard swim in 10 minutes or less; current advanced lifesaving certification.

Recreational Dance (PE AC)

See Theatre Arts for additional dance classes.

11. Folk Dance (1). (Former PE AC 111A)

12. Elementary Social Dance (1). (Former PE AC 112A)

13. Square Dance (1). (Former PE AC 113A)

112. Intermediate Social Dance (1). Prerequisite: PE AC 12 or equivalent. (Former PE AC 112B)

Individual Activities (PE AC)

15. Basic Massage (1). Fundamental massage techniques; types of massage and their usage; physiological and psychological effects of massage, classical Swedish massage strokes and their sequence. (Former PE AC 80T section)

16. Adapted Physical Activity (1). Individually designed activity for disabled students. (Former PE AC 116)

17. Elementary Archery (1). (Former PE AC 117A)

18. Backpacking (2). Limited to novice backpackers. (Estimated cost to student approximately $50 for supplies, transportation.) (Former PE AC 118)

19. Elementary Badminton (1). (Former PE AC 119A)

20. Elementary Bicycling (2). Introduction to bicycling as a lifetime sport. Bicycle selection, care, and maintenance. Traffic laws and bicycle safety. Student must provide own ten-speed bicycle. Two all-day rides on Saturday. Medical clearance required. (Former PE AC 120A)

21. Elementary Strength Training (1). (Former PE AC 121A)

22. Elementary Bowling (1). (Former PE AC 122A) (Approximate course fee, $25)

24. Elementary Conditioning Exercises and Aerobics (1). (Former PE AC 124A)

27. Elementary Fencing (1). (Former PE AC 127A)

30. Elementary Golf (1). (Former PE AC 130A)

31. Elementary Gymnastics (1). (Former PE AC 131A)

39. Jogging (1). (Former PE AC 139)

40. Elementary Karate (1). Japanese style of Shotokan Karate. (Former PE AC 140A)

41. Judo (1). (Former PE AC 80T section)

42. Physical Training (2). A wide variety of individual exercises and team competition utilizing a military model. (Former PE AC 142)

46. Elementary Racquetball (1). (Former PE AC 146A)

50. Self Defense (1). (Former PE AC 150)

51. Self Defense for Women (1). (Former PE AC 151)

52. Skiing (2). Limited to novice skiers. (Former PE AC 152) (Approximate course fee, $50)

54. Elementary Tennis (1). (Former PE AC 154A)

60. Yoga (1). (Former PE AC 160)

117. Intermediate Archery (1). Prerequisite: PE AC 17 or equivalent. (Former PE AC 117B)

119A. Intermediate Badminton (1). Prerequisite: PE AC 19 or equivalent. (Former PE AC 119B)

119B. Advanced Badminton (1). Prerequisite: PE AC 119A or equivalent. (Former PE AC 119C)

120. Cycling for Fitness (2). Prerequisite: PE AC 20 or equivalent. (Former PE AC 120B)

121. Intermediate Strength Training (2). Prerequisite: PE AC 21 or equivalent. (Former PE AC 121B)

122. Intermediate Bowling (1). Prerequisite: PE AC 22 or equivalent. (Former PE AC 122B) (Approximate course fee, $25)

124. Intermediate Conditioning Exercises and Aerobics (1). Prerequisite: PE AC 24 or equivalent. (Former PE AC 124B)

127. Intermediate Fencing (1). Prerequisite: PE AC 27 or equivalent. (Former PE AC 127B)

130. Intermediate Golf (2). Prerequisite: PE AC 30 or equivalent. (Former PE AC 130B) (Approximate course fee, $12)

131. Intermediate Gymnastics (1). Prerequisite: PE AC 31 or equivalent. (Former PE AC 131B)

140. Intermediate Karate (1). Prerequisite: PE AC 40 or equivalent. Japanese style of Shotokan Karate. (Former PE AC 140B)

146. Intermediate Racquetball (1). Prerequisite: PE AC 46 or equivalent. (Former PE AC 146B)

154A. Intermediate Tennis (1). Prerequisite: PE AC 54 or equivalent. (Former PE AC 154B)

154B. Advanced Tennis (1). Prerequisite: PE AC 154A or equivalent. (Former PE AC 154C)

Team Activities (PE AC)

65. Basketball (1). (Former PE AC 165)

68. Soccer (1). (Former PE AC 168)

70. Flag Football (1). (Former PE AC 170)

71. Elementary Volleyball (1). (Former PE AC 171A)

73. Softball (1). (Former PE AC 173)

80T. Topics in Physical Education (1–2). Participation in and investigation of selected physical activities not in current curriculum. (Former PE AC 180T)

171A. Intermediate Volleyball (1). Prerequisite: PE AC 71 or equivalent. (Former PE AC 171B)

171B. Advanced Volleyball (1). Prerequisite: PE AC 171A or equivalent. U.S.V.B.A. rules will be followed. (Former PE AC 171C)

Physical Education (P E)

30. History and Foundations of Physical Education (3). History, foundations and legal aspects of physical education programs; personal, social and professional requirements; demands on the physical education teacher and athletic coach.

31. Concepts of Human Movement (3). Experiencing and studying concepts in selected aspects of human motor performance. Topics include fundamental movements, mechanical principles, perceptual theory, cultural effects, physiological factors and learning theory as they affect human movement. General Education BREADTH, Division 4. (2 lecture, 2 lab hours)

105. Fundamental Principles of Exercise (3). Fundamental principles of anatomy, physiology and biomechanics upon which to base the teaching and coaching of physical activities. (Note: Does not satisfy physical education major requirements.)

106A. Care and Prevention of Athletic Injuries (3). Designed for prospective coaches, trainers, health and physical educators; to aid in the recognition, evaluation and care of athletic injuries. Techniques in taping, prevention and rehabilitation of injuries.

106B. Advanced Care and Prevention of Athletic Injuries (3). Prerequisite: P E 106A, P E 156A, H S 48. Advanced study in athletic training including organization and administration, injury recognition, evaluation and rehabilitation.

106C. Therapeutic Exercise and Modalities in Athletic Training (3). Prerequisite: P E 106A, 156A, H S 48. The development and application of rehabilitation programs and the use and application of the various modalities used in the treatment of athletic injuries.

106D. Seminar in Athletic Training (1; max total 4). Prerequisite: admission into Athletic Training Program. To be taken concurrently with P E 107. Current procedures in acute injury management, rehabilitation and training room organization and supervision.

107. Internship in Athletic Training (1; max total 4). Prerequisite: P E 106A, H S 48, Phy 33 or 64 and admission into Athletic Training Program. To be taken concurrently with 106D. Practical experience in the field of athletic training.

108. Organization of Intramural Sports-Recreational Games (2). Organization, administration and promotion of intramural activities.

111. The Olympic Games (3). History, development, significance and future of the Olympic Games; Olympian as a microcosm of cross cultural and interpersonal understandings and relationships. General Education CAPSTONE Cluster. (Former PE 180T section)

112C. Officiating Track and Field (1). Analysis and interpretation of rules for track; procedures, mechanics and practice in officiating. (1–2 hour lecture-lab)

114. Aerobic Exercise Program Development (2). A class designed to train the student in aerobic fitness class leadership and aerobic exercise program development. (1 lecture, 2 lab hours) (Former P E 180T section)

115D. Theory and Analysis of Gymnastics (3). Prerequisite: gymnastics skill tests. Analysis of skill performance, theory of progressions, class organization, spotting techniques, development of routines, legal aspects and safety. (2 lecture, 2 lab hours)

115K. Theory and Analysis of Fitness and Conditioning (3). Prerequisites: P E 156A–B. Study, practice, analysis and development of fitness and weight control programs. (2 lecture, 2 lab hours)

125A. Coaching Football (3). Principles underlying participation in competitive football.

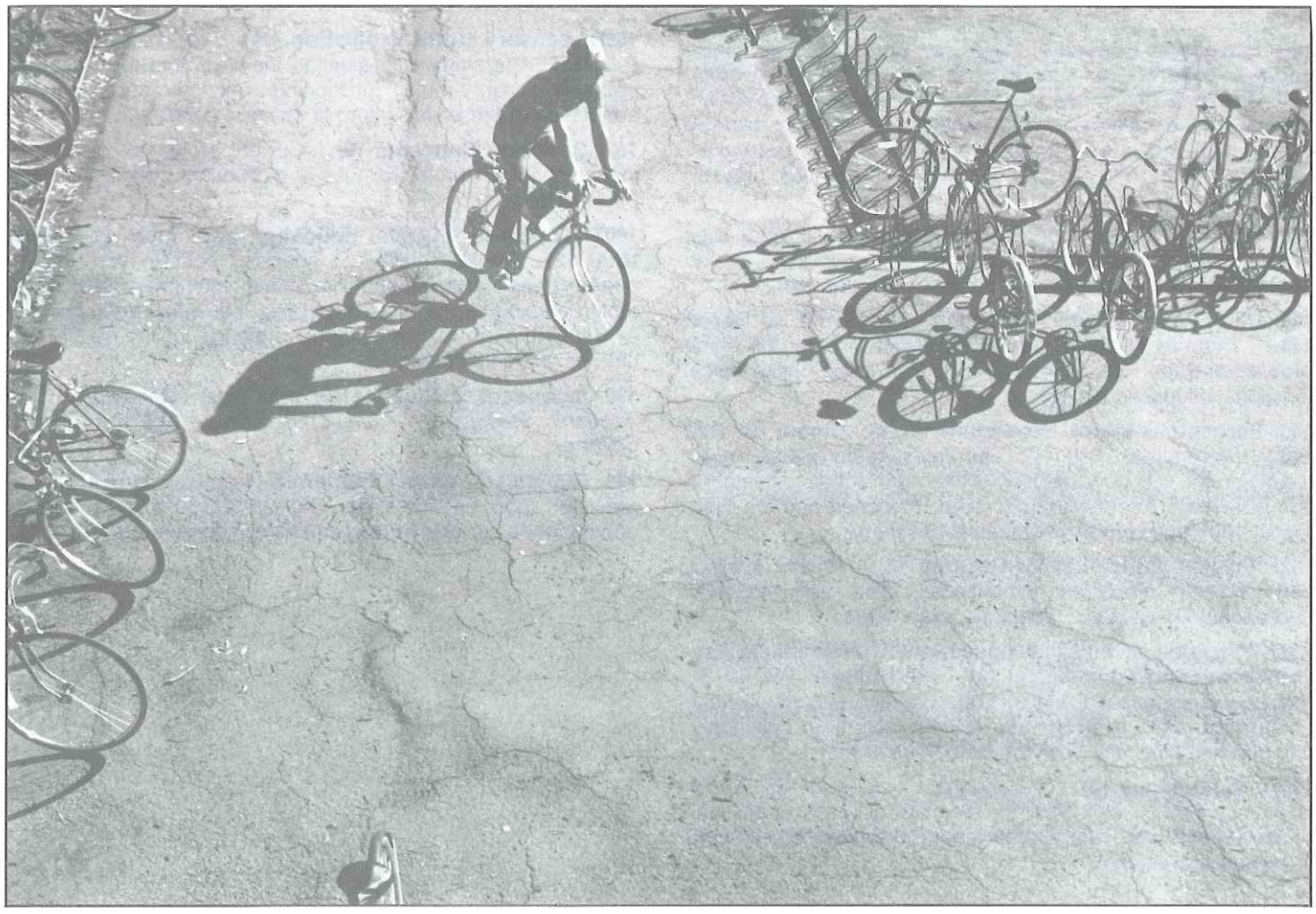
125B. Coaching Basketball (3). Principles underlying participation in competitive basketball.

125C. Coaching Track and Field (3). Principles underlying participation in competitive track and field.

125D. Coaching Baseball (3). Principles underlying participation in competitive baseball.

135B. Theory and Analysis of Wrestling and Combative Activities (3). Rules, philosophy, scoring, training, skill analysis, and progression in wrestling and other combative activities. Analysis and practice of skills. (2 lecture, 2 lab hours)

135E. Theory and Analysis of Basketball/Flag Football/ Softball (3). Prerequisite: skill tests in basketball, flag football and softball. Analysis and performance of skills and strategies.



Theory of skill progressions, class organization, officiating and evaluation. (2 lecture, 2 lab hours)

135H. Theory and Analysis of Soccer/Volleyball (3). Prerequisite: volleyball skill test. Analysis and performance of skills and strategies. Theory of skill progressions, class organization, officiating and evaluation. (2 lecture, 2 lab hours)

144. Instructional Laboratory (1). Limited to major students. Designed to provide an opportunity to work in an instructional situation.

145A. Theory and Analysis of Aquatics (3). Prerequisite: aquatics skill test. Study and practice of varied levels of swim strokes; elements of diving; skills basic to lifesaving; skill progression; water polo, scuba diving, synchronized swimming, training for competition, basic elements of adapted aquatics. (2 lecture, 2 lab hours)

145B. Theory and Analysis of Tennis/Badminton (3). Prerequisite: tennis skill test. Study and practice of strokes and tactics; rules; history; skill progression for various levels. (2 lecture, 2 lab hours)

145C. Theory and Analysis of Golf/Archery (3). Prerequisite: golf skill test. Study and practice of values and fundamentals in golf and archery. Organization and conduct in physical education programs. (2 lecture, 2 lab hours)

145D. Theory and Analysis of Folk, Square and Social Dance (3). Prerequisite: folk dance skill test. Analysis and practice of basic skills of folk, square and social dance. Development of understanding and appreciation of these forms of dance in various cultures. Study and practice of leadership skills in recreational dance. (2 lecture, 2 lab hours)

146. Movement Education Clinic for Educationally Handicapped Children (3; max total 9; repeatable for credit). Clinical experience in diagnosis and evaluation of movement skills and needs of educationally handicapped children followed by individual prescriptive program development and instruction. Experience to include program planning, execution and ongoing evaluation.

147. Physical Growth and Development (3). Prerequisite: Phy 33. Physical growth and development from prenatal period through old age with emphasis on motor development.

148. Biophysical Aspects of Aging (3). (Same as Geron 148.) Theories of aging, biological mechanisms of the aging process and the role of physical activity in those physiological functions influenced by age.

150. Perceptual Motor Development (3). (Same as Rec 150.) Prerequisite: P E 147. The study of perceptual motor development, with consideration of the organization and integration of sensory information and motor response and the theoretical approaches to developmental programs.

152. Physical Education for Children (3). Theory, analysis and study of movement experiences, skills and materials, appropriate for children. (2 lecture, 2 lab hours)

153. Principles of Physical Education: Philosophical, Psychological, and Sociological (3). Prerequisites: P E 30, 31. Examination of personal and cultural experiences in creative and competitive sport, exercise and dance events from philosophical, psychological and sociological perspectives.

156A. Kinesiology (3). Prerequisite: Phy 33 or 64–65, P E 31. Human movement: biological and mechanical bases, application of skeleto-muscular considerations and principles of mechanics to human movements.

156B. Physiology of Exercise (3). Prerequisite: Phy 33 or 64–65, P E 31, and FScN 54 or FScN 147. Physiologic bases of movement, work and exercise; physiologic concepts related to such processes as respiration, circulation, muscle function, metabolism, heat regulation and to their roles in physical activity.

157A. Adapted Physical Education (3). Prerequisite: P E 156A. The design, implementation and evaluation of individually prescribed adapted physical education programs for the handicapped in school and special settings. (2 lecture, 2 lab hours)

157B. Prescriptive Teaching in Adapted Physical Education (2). Prerequisite: P E 157A, P E 159B. The design, implementation and evaluation of individually prescribed adapted physical education programs for the handicapped in school and special settings. (1 lecture, 2 lab hours)

158A. Physical Education for the Severely Handicapped (2). The study of motor, behavioral and learning characteristics of the severely handicapped and the development of appropriate movement and sports activities.

158B. Physical Education for the Orthopedically Handicapped (2). The study of motor, behavioral and learning characteristics of the orthopedically handicapped and the development of appropriate movement and sports activities.

159A. Measurement and Evaluation in Physical Education (3). Prerequisite: P E 30. The study of the selection, construction, evaluation, and administration of both norm referenced and criterion referenced tests for use in judging various aspects of physical performance and knowledge. The application of electronic word processing, statistical methodology and the interpretation of statistics.

159B. Sensory Motor Evaluation (2). Prerequisite: P E 150, P E 159A. The study of evaluation methods and tests used to appraise sensory-motor functioning, and the application or adaptation of these devices to fit specific populations.

162. Coaching Concepts (3). Current problems of coaches in the school setting; techniques of motivation, organization and public relations.

180T. Topics in Physical Education and Sport (1–3; max total 12). Topics relating to analysis, performance, theory, current trends and research in human movement specific to motor learning in programs of physical education and sport not available through current curricula offerings for the undergraduate or graduate student.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

199. Supervised Work Experience (1–2; max total 4). Prerequisite: upper-division status, GPA 2.5 last 30 units, consent of department chair and instructor. *CR/NC* grading only.

GRADUATE COURSES

(See *Course Numbering System.)*

220. Seminar in Special Physical Education (3). Seminar dealing with current topics in special physical education: physiological and psychological profiles of disabled individuals, federal and state legislation, assessment, and designing individualized exercise programs. Students will explore computer-assisted and managed instruction as related to special physical education.

222. Analysis of Athletic Performance (3). Prerequisite: P E 156A and 156B. Consideration of the factors affecting performance in various sports. Application of laws of physics, principles of exercise, physiological and psychological considerations to human performance. Intensive research in the analysis of sports skills.

223. Scientific Basis of Motor Learning (3). Seminar in the study of human movement from a physio-psychological perspective. Emphasis on learning theories, motor educability, and kinesthetic awareness in human movement via sport, dance and games.

230. Statistical Inference in Physical Education (3). Theory and nature of statistical inference; seminar in the study of statistical methodology relating to the selection of the most appropriate statistical method, the correct application of the statistical technique and the interpretation of findings.

231. Research in Physical Education and Recreation (3). Seminar in research methodology; identification of researchable problems in physical education and related areas; use of library resources, data gathering and analyses, critiquing of recorded research, writing of research reports.

233. Advanced Exercise Physiology I: Metabolic and Neuromuscular Physiology (3). Prerequisite: P E 156A, 156B, Chem 3A, 3B. Detailed study of the biochemistry of energy metabolism, biophysical and functional concepts related to interaction of nerve and muscle, and response to training. Theoretical concepts supported by extensive practical experience in the human performance lab. (2 lecture, 3 lab hours)

234. Advanced Exercise Physiology II: Cardiovascular and Respiratory Physiology (3). Prerequisite: P E 156A, 156B. In-depth study of cardiovascular and respiratory concepts related to exercise, training, health, disease and aging. Theoretical concepts are supported by extensive practical experience in the human performance lab. (2 lecture, 3 lab hours)

240. Facilities and Equipment in Physical Education (3). Functional planning of indoor and outdoor facilities for schools and recreation centers. Design and layout of school physical education-athletic facilities. Evaluation of school plants in the Fresno and valley area. Budget considerations in planning for the purchase of equipment.

241. Administration in Physical Education (3). Examination of innovative ideas in the fields of education and physical education which relate to physical education administration. Emphasis on discovering ways to incorporate recent information to establish programs.

242. Program Development in Physical Education (3). Study of the current education scene to provide students with an understanding of the role that school physical education plays in today's education. Identification of sound procedure and practice in organizing and conducting relevant programs of physical education.

250T. Topics in Physical Education (3; max total 6 if no topic repeated). Advanced studies in theoretical research in selected topics.

260. Historical Concepts of Physical Education (3). Interpretation of exercise and sport in western thought and practice, from 3000 B.C. to the present.

261. Philosophy/Issues in Physical Education and Sport (3). Critical examination of current issues; philosophical seminar focused on recent and classical literature in physical education and sport. Required of M.A. candidates; successful completion satisfies graduate qualifying examination requirement.

262. Social Implications of Sport (3). Cultural and social factors related to play, games and athletic contests; social parameters in the conduct and management of school athletic programs; emphasis on research studies.

263. Psychology of Sport (3). An examination of the concepts in sports psychology, motivational variables, emotional states and personality variables; mental states, behavioral techniques and strategies; and issues in sports psychology.

285. Internship in Administration (3–6). Prerequisite: P E 230, 231, 241 and 261. Experience in critical and independent thinking in a mentored, administrative setting in an accredited physical education and/or athletic program within the university's service area. *CR/NC* grading only.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

298. Project (3–6; max total 6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion, submission and/or demonstration of an original project. Creativity shall be a prime factor. Abstract required, i.e., choreograph gymnastic performance, organize square/folk dance program, compose audio-visual representation of sport forms. Approved for *SP* grading.

299. Thesis (2–6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSES

(See *Course Numbering System.)*

310. Analysis of Team Activities (1–3; max total 12 if no area repeated). Prerequisite: teaching or coaching experience or by permission of instructor. An analysis of the techniques, methods, procedures and theory of team sports.

320. Analysis of Individual Activities (1–3; max total 12 if no area repeated). Prerequisite: teaching or coaching experience or by permission of instructor. An analysis of the techniques, methods, procedures and theory of individual activities.

Physical Therapy

School of Health and Social Work
Physical Therapy Program
Darlene L. Stewart, Coordinator
McLane Hall, Room 188
(209) 278-2625

B.S. in Physical Therapy



Physical therapy is a health profession that is involved with restoration of function of persons who have suffered loss or disturbance of locomotion due to disease or injury to the neurological, musculoskeletal, cardiopulmonary and integumentary systems. The physical therapist, through evaluation and treatment planning, utilizes physical agents, heat, light, electricity, ultrasound and a variety of therapeutic exercise techniques to bring about physical restoration of function.

The Physical Therapy Program leads to a Bachelor of Science degree with a major in physical therapy and a Certificate of Internship in Physical Therapy. It is a four-year curriculum plus a postbaccalaureate clinical internship at the end of the last year. Completion of the degree and internship are required to sit for the state examination to be licensed.

Faculty and Facilities

The Physical Therapy Program consists of seven faculty, each of whom has special expertise in major areas of physical therapy. The curriculum design is a regional integrated approach to patient management with special emphasis on problem solving. Clinical laboratory experience is conducted by physical therapists in local facilities. Internships are available in selected facilities throughout the state.

The program philosophy focuses on preparation of a physical therapist who functions effectively in a general acute care setting. It encourages self-discipline and individual self-assessment for planning for continued professional growth.

The Physical Therapy Program is a popular major and receives more applicants than can be accommodated. The program accepts 32 students in the fall of each year. Class size is limited due to the clinical component of the program curriculum and by accreditation standards. Therefore, the program has supplemental criteria for selection into the major. These criteria appear on the next page.

Career Opportunities

Physical therapists work in a variety of settings. Some are: a hospital, rehabilitation center, private practice, extended care facility, home health agency, public and private schools for the handicapped, and sports medicine clinics. Recent studies indicate that the current manpower shortage will continue and that there will continue to be a strong job market for physical therapists. The starting salaries are very good, as are opportunities for advancement.

General information about the Physical Therapy Program can be obtained from the Admissions Office, Physical Therapy Clerk, Joyal Administration Building, California State University, Fresno; Fresno, California 93740, (209) 278-2664.

Faculty

Darlene L. Stewart, *Coordinator*

Sondra Dunkle
Janet K. Duttarer
Joanne M. Laslovich
Gary L. Lentell
Robert K. Martin
Jonathan T. Spry

General Program Adviser: JoAnn Jaurigue
Pre-Physical Therapy On-Campus Adviser: Darlene L. Stewart
Physical Therapy Major Advisers: Sondra Dunkle, Janet Duttarer, Joanne M. Laslovich, Gary L. Lentell, Robert K. Martin, Jonathan T. Spry, Toni M. Tyner

Bachelor of Science Degree Requirements
Physical Therapy Major

1. Major requirements: *Units*
   Ph Th 115, 116, 120, 121, 122, 124, 130, 131, 132, 133, 134, 142, 143, 144, 151, 152, 153, HSW 101, Phy 160.....60
2. Prerequisite requirements (prephysical therapy preparation).....38*
   a. Courses which *must be completed by the fall semester prior to applying to the program:*
      Chem 3A * (see Note 1), Zool 10 *, Psych 10 * (see Note 2)
      Phy 64–65, Phys 2B, Ph Th 127 ..... (28)
   b. Courses which *must be completed by the spring semester prior to entering the program:*
      Phy 155, H S 92 * (see Note 3), Psych 166 (normally these classes are taken at CSU, Fresno) ..... (10)
3. General Education requirements for physical therapy majors (see Note 4).....52

Total 138

Postbaccalaureate Certification requirement *(units are not applicable to the B.S. Degree)* Ph Th 175.....8

* Twelve units of the following prerequisite courses also may be used to satisfy General Education courses: H S 92 (Core, Math substitute, as appropriate), Chem 3A (BREADTH, Division 1), Zool 10 (BREADTH, Division 2), Psych 10 (BREADTH, Division 3).

In effect, 12 of the 38 prerequisite units may be used to satisfy both General Education and prerequisite requirements concurrently. As a result, if courses are taken judiciously, the minimum unit requirement for the physical therapy major is 138 units.

Notes:

1. Chem 3B (3 units) may be substituted for Chem 3A (4 units); Chem 1A–1B (10 units) may be substituted for Chem 3A/3B (3–4 units).
2. Many students take a three-unit class at another college that is the equivalent of Psych 10 (4 units) at CSU, Fresno. In this case, the remaining unit is automatically waived.
3. Students are expected to have completed intermediate algebra in high school which allows H S 92 to satisfy the General Education — Core, Mathematical Concepts and Quantitative Reasoning requirement. (See *General Education — Core.*) All General Education requirements with the exception of Capstone must be completed prior to entering the major.
4. Physical therapy majors are required to complete CAPSTONE. Select from IntD ____Nex, IntD or a cluster.
5. *CR/NC* grading is not permitted in the physical therapy major with the exception of Ph Th 151, 152, 153, 175.
6. General Education prerequisite requirements and elective units also may be used toward a dual major or minor. (See *Dual Major,* or *departmental minor.*) Consult the appropriate department chair, program coordinator or faculty adviser for further information.

Supplemental Criteria For Selection Into The Major

An application for admission to the university must be completed to determine the student's eligibility. A separate application must be submitted to the Admissions Office on or before February 1 of the year the student wishes to enter the program. All required prerequisites must be completed by the end of the spring semester prior to entering the major. A very limited number of students are admitted to the program each fall. Applications to the Physical Therapy Program will be screened during the spring semester.

The following admissions criteria are reviewed by the screening committee:

(1) The student must apply to the university.
(2) Completion of the prerequisite units as listed above.
(3) A grade of *B* or better in each of the prerequisite courses. A required course may be repeated only once for admission consideration if a grade of *C* or lower has been received.
(4) Completion of General Education requirements except 3 units of Capstone which may be taken during the major.
(5) Evidence of knowledge of physical therapy through employment, volunteering or observation in a physical therapy department for a minimum of 100 hours. Fifty hours must be in a general acute care setting; 50 hours may be in a special area of practice.
(6) Participation in a personal interview.

Recommended foundation courses are high school chemistry, physics, algebra, geometry and biology.

Meeting the above criteria does not guarantee acceptance into the major.

Students transferring from community colleges and other colleges or universities who meet the above criteria are considered on the same basis as California State University, Fresno, students applying for admission to the major.

Criteria for retention and progression in the program include a grade of *C* or better in each physical therapy course and completion of all courses in the major.

Students must carry malpractice insurance, must purchase an appropriate laboratory coat, and must provide their own transportation to hospitals and clinics for off-campus classes and clinical laboratories. Students must also provide for all expenses while taking the postbaccalaureate clinical internship at the end of the senior year. Expenses include tuition through summer school extension, housing, meals and travel. For supplemental application form write to the Admissions Office, California State University, Fresno; Fresno, California 93740 and include a self-addressed legal size envelope for requested return information.

COURSES

Physical Therapy (Ph Th)

100. Career Options in Health Care (2). Recommended for health professions students, but open to all students. May be taken concurrently with Ph Th 105. An exploration of career opportunities in health care professions.

105. Medical Terminology for Health Professionals (2). Recommended for Physical Therapy majors, but open to all students. Study of word parts, definitions, spelling, analysis, synthesis and use of medical vocabulary.

115. Applied Anatomy and Kinesiology I (4). Prerequisite: Phys 64, 65, 155. Structure and function of the neuromusculoskeletal systems with emphasis on concepts of movement, biomechanics and surface anatomy. Includes dissection labs and prosected material. (3 lecture, 3 dissection lab hours)

116. Applied Anatomy and Kinesiology II (4). Prerequisite: Ph Th 115. Continuation of Applied Anatomy and Kinesiology I. (3 lecture, 3 dissection lab hours)

120. Professional Orientation (2). An introduction to the professional practice of physical therapy including roles and functions within the health care delivery system and professional responsibilities.

121. Patient Management Skills I (3). Selected theory and clinical application of therapeutic modalities and procedures in the treatment of physical disabilities, including physical agents, exercise and massage. (1 lecture, 6 lab hours)

122. Patient Management Skills II (2). Prerequisite: Ph Th 121. Continuation of Patient Management Skills I. (1 lecture, 3 lab hours)

124. Research Methods in Physical Therapy (3). Prerequisite: H S 92 or Math 11. Study and application of research design and critical reading of research literature.

125. Advanced Human Anatomy of the Neuromusculoskeletal System (4). Prerequisite: Phy 64, 65. Recommended for health professions students, but open to all students. Advanced study of the structure and function of the neuromusculoskeletal systems with emphasis on surface, muscle anatomy and joint anatomy, nerve and blood supply. Includes dissection lab and prosected materials. (3 lecture, 3 dissection lab hours)

126. Applied Pathophysiology (4). Prerequisite: Phy 64, 65. Recommended for health professions students, but open to all students. Advanced study of physiology of body systems and responses to normal aging, environmental influences and pathological dysfunction, including cardiovascular, pulmonary, endocrine and integumentary systems. Includes dissection lab and prosected materials. (3 lecture, 3 dissection lab hours)

127. Neuromuscular Processes in Human Development and Aging (3). Recommended for health professions students, but open to all students. The study of human development from birth to senescence with focus on concepts of motor and neurological development processes integral to evaluation and treatment intervention in neurological disability. (2 lecture, 3 lab hours)

130. Evaluation and Clinical Management of Musculoskeletal Conditions I (4). A study of musculoskeletal disabilities with emphasis on evaluation techniques, methods of therapeutic intervention and program planning. Includes selected lectures by medical practitioners in the medical-surgical management of orthopedic conditions. (3 lecture, 3 lab hours)

131. Evaluation and Clinical Management of Musculoskeletal Conditions II (4). Prerequisite: Ph Th 130. A continuation of Evaluation and Clinical Management of Musculoskeletal Conditions I. (3 lecture, 3 lab hours)

132. Evaluation and Clinical Management of Neurological Systems I (6). Evaluation and therapeutic intervention in the clinical management of normal and pathological conditions of the neuromusculoskeletal systems. Includes normal growth and development and selected medical lectures. (4 lecture, 6 lab hours)

133. Evaluation and Clinical Management of Neurological Systems II (3). Prerequisite: Ph Th 132. Continuation of Evaluation and Clinical Management of Neurological Systems I. (2 lecture, 3 lab hours)

134. Evaluation and Clinical Management of Selected Body Systems (4). Evaluation and therapeutic intervention in the clinical management of normal and pathological conditions of the cardiopulmonary and other selected body systems. (3 lecture, 3 lab hours)

142. Humanistic Approaches to Patient Management (3). Prerequisite: permission of instructor. Investigation of theories and concepts which influence patient management effectiveness and compliance.

143. Organization and Administration of Physical Therapy Services (3). Principles of planning, organizing and administering physical therapy services in a variety of health care settings, exploration of medical/legal and regulatory aspects in the practice of physical therapy including future trends and issues in practice.

144. Trends and Issues in Practice (3). An investigation of emerging trends in physical therapy practice and other health related professions. Subjects to be covered may vary.

151. Clinical Lab I (2). Prerequisite: Ph Th 121, 130. The application of physical therapy skills and procedures in health care facilities. *CR/NC* grading only.

152. Clinical Lab II (2). Prerequisite: Ph Th 151. A continuation of Clinical Lab I. *CR/NC* grading only.

153. Clinical Lab III (2). Prerequisite: Ph Th 152. Continuation of Clinical Lab II. *CR/NC* grading only.

175. Postbaccalaureate Clinical Internship (8). Prerequisite: Ph Th 153. Summer offering only as final experience for majors. The internship is 18 weeks of clinical experience at selected facilities throughout the state. Certification of completion of internship is required before the graduate is eligible to take the state examination for licensure. *CR/NC* grading only.

180T. Topics in Physical Therapy (1–3; max total 12 if no topic repeated). Prerequisite: permission of instructor. Advanced techniques in physical therapy and new trends relating to the care of patients.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study. Approved for SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

302T. Selected Topics in Physical Therapy (1–6; repeatable with different topics). Selected topics in Physical Therapy for practicing clinician in the health fields.

Physics and Physical Science

School of Natural Sciences
Department of Physics
John R. Donaldson, Chair
McLane Hall, Room 169
(209)278-2371

B.A. in Physics
B.S. in Physics
Minor in Physics
Minor in Physical Science
M.A. in Physics
M.S. in Physics
Single Subject Teaching Credential in Physical Science (Physics Option)

The fascination of physics is that it is so fundamental: the continuing attempt to understand how things work! It combines observational and experimental grappling with nature to get the facts of behavior, with the creative synthesis of these facts into theories and laws of nature, often beautiful in their simplicity and universality.

Albert Einstein said, "They (the laws of theoretical physics) should form the basis from which a picture of all processes of nature can be derived by thoughtful deduction — and these include also the processes of life." He also said, "The deeper we search, the more we find there is to know, and as long as human life exists, I believe it will always be so."

More specifically, physics includes the study of the fundamental particles that make up nuclear particles, of electromagnetic, gravitational, atomic and nuclear forces, of energy, of light and heat, of electronics and the structure of materials, of the interiors of the earth and the stars.

Faculty and Facilities

Our faculty came here to teach. In addition, some faculty have developed continuing research projects, usually involving students.

Classes are small; our upper-division and graduate classes run from 1 to 15 students. Physics majors get to know each other and our professors personally, often with friendships continuing after graduation.

We have a new medium-energy laser, which greatly increases our capabilities in modern optics, including non-linear optics, and a new, very flexible X-ray facility that creates many new possibilities in X-ray fluorescence spectroscopy and opens several other fields to us. Our clean room has been improved. In addition, we have well-equipped laboratories for thin film studies, low temperature work, electronics and microcomputer applications, and atomic and nuclear spectroscopy. Further, we have easy access to both mainframe and microcomputers.

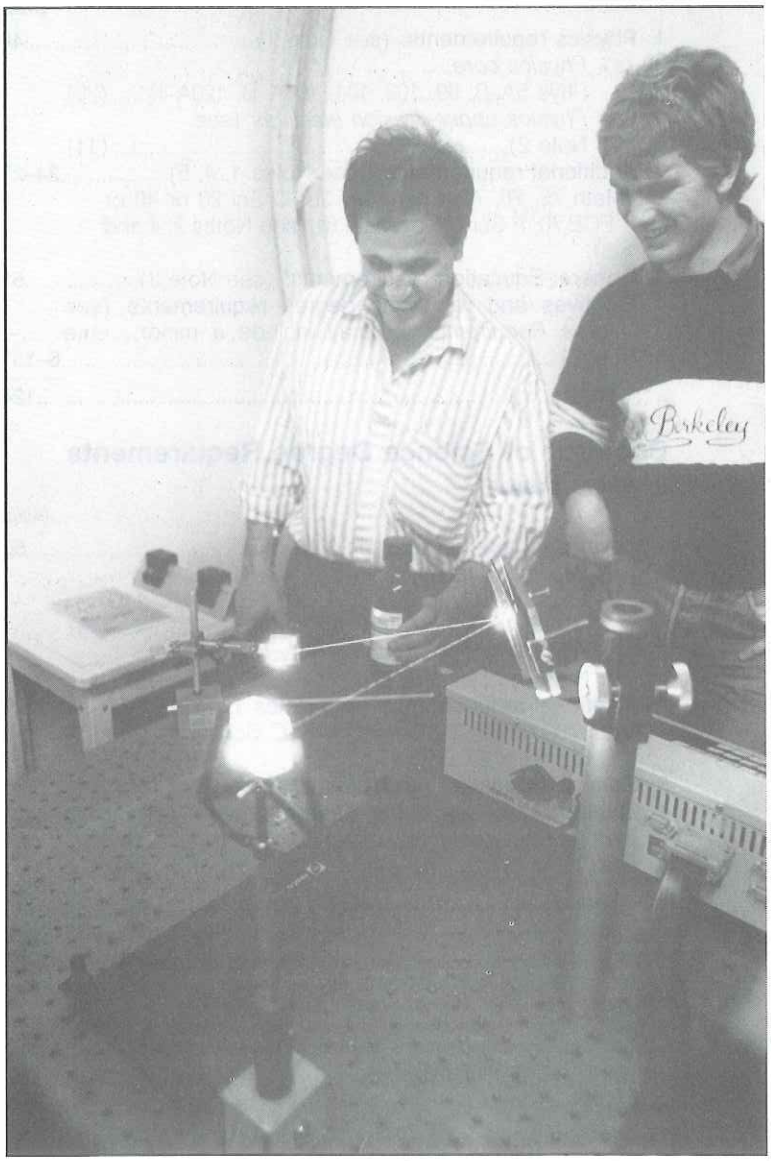
Career Opportunities

Half of our bachelor's degree graduates have gone directly into various graduate schools, and the other half have gone to work in industry or government. Our record for admission to medical schools has been outstanding: every physics major who has applied has been accepted over at least the last decade. Four of our graduates are now practicing physicians, one is a dentist and two more are in medical school.

Now the outlook is even better, with the demand for industrial physicists increasing and a shortage developing for high school physics teachers, at the same time the image and pay of teachers is improving rapidly. Employment usually turns out to be not just a job, but an opportunity for interesting, educational and exciting work — PHYSICS IS FUN!

Similarly, many of our master's degree graduates have gone on to doctoral studies elsewhere, and others have gone into industry, government or teaching.

From these students we hear of increasing levels of responsibility, work on the forefront of knowledge and some entry into management.



Faculty

John R. Donaldson, *Chair*

Sheldon J. Brown
Manfred Bucher
Jon R. Dews
Donald E. Holmes
Floyd L. Judd
Vanvilai Katkanant
Brandt Kehoe
Hugh A. Williamson
Michael J. Zender

Graduate Adviser: Michael J. Zender
Preoptometry Adviser: Floyd L. Judd
Premedical Adviser: Donald E. Holmes

Bachelor of Arts Degree Requirements

Physics Major

	Units
1. Physics requirements: (see Note 1)	40
(a) Physics core: Phys 5A–B, 99, 102, 104, 105A–B, 120A–B	(29)
(b) Physics upper-division electives (see Note 2)	(11)
2. Additional requirements: (see Notes 1, 4, 5) Math 75, 76, 77; Chem 3A, 3B; C Sci 20 or 40 or ECE 70; P Sci 106 or Math 81 (see Notes 2, 4 and 5)	24–27
3. General Education requirements: (see Note 3)	51
4. Electives and remaining degree requirements (see *Degree Requirements*); may include a minor: (see Note 3)	6–15*
Total	124

Bachelor of Science Degree Requirements

Physics Major

	Units
1. Physics requirements: (see Note 1)	50
(a) Physics core: Phys 5A–B, 99, 102, 104, 105A–B, 107A, 110, 115, 120A, 130, 140, 162, 170A	(46)
(b) Physics upper-division electives (see Note 2)	(4)
2. Additional requirements: (see Notes 1, 4, 5) Math 75, 76, 77, 81; Chem 1A–B; C Sci 20 or C Sci 40 or ECE 70	28–30
3. General Education requirements: (see Note 3)	51
4. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a minor: (see Note 3)	0–6*
Total	129–131

* This figure takes into consideration that one General Education CORE class and a BREADTH Division 1 class also may be applied to satisfy physics major additional requirements (see *General Education*). Under this provision, up to 6 units of courses required for the physics major also may be used to satisfy General Education requirements. Consult the physics department chair or your faculty adviser for additional details.

Notes:

1. *CR/NC* grading is not permitted in the physics major with the exception of Phys 99. Additional requirements, however, may be taken *CR/NC* (see *Credit/No Credit* Grading).
2. Courses outside the Department of Physics may be substituted for physics upper-division electives with prior approval of the department chair.
3. General Education and elective units may be used toward a minor (see departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.
4. Courses which satisfy additional requirements may also be used to satisfy requirements in General Education, a dual major or a minor, as appropriate.
5. Students without a strong foundation in mathematics should consider substituting Math 71 and 72 for Math 75.

Suggested Sequence of Courses for Bachelor of Science Degree

In addition to the specific courses listed below, general education requirements and electives should be included to bring the total to 15–17 units per semester. A total of 129 units must be completed for the Bachelor of Science degree. (See *Degree Requirements*.)

1st Year: Phys 5A, 99, Math 75, 76, Computer Programming, Chem 1A–B
2nd Year: Phys 5B, 102, 104, Math 77, 81
3rd Year: Phys 105A–B, 110, 120A, 162, 170A plus upper-division electives
4th Year: Phys 107A, 115, 130, 140 plus upper-division electives

Physics Minor

A minor in physics for a bachelor's degree requires the following:

	Units
Phys 5A–B	10
Phys 102	3
Other upper-division physics	6
	19

Credential Program

The Physical Science Waiver Program is designed specifically for students planning to teach in California secondary schools. A total of 140 units will earn a B.A. in physics and a preliminary credential, with eligibility to begin teaching.

	Units
I. Core: Phys 5A–B, 102, 105A, 120A, Geol 1, Chem 1A–B, 8	36
II. Breadth: Phys 110, P Sci 106, 168, C Sci 20, Geog 111	16

Graduate Programs

The Department of Physics offers graduate instruction and research leading to either the Master of Arts or the Master of Science degree. Each is explained below.

For general information, read *Graduate Studies and Research* in this catalog, and in particular the sections on *Admission to Graduate Standing, Advancement to Candidacy and Program Requirements*. The minimum entrance requirement is a GPA of 2.5 over the last 60 units and a score of at least 600 on the Quantitative or 1000 on the Verbal plus Quantitative parts of the GRE General Examination which should be taken before applying for admission. In exceptional cases, it is possible to postpone the GRE until the first semester at CSUF.

It is important to achieve classified standing quickly, before completion of 10 units. The next step is advancement to candidacy, after completion of at least 9 units of graduate study with a minimum GPA of 3.0 and satisfaction of the writing proficiency requirement. For M.A. students, advancement re-

quires passing a Departmental Qualifying Exam; for M.S. students, the requirement is a score of at least the 25th Percentile on the Subject (Advanced Physics) GRE.

Teaching assistantships may be available, as well as general financial aid. For some forms of financial aid, application must be complete before the end of February.

For specific questions, consult the chair of the department or the graduate adviser.

Master of Science Degree Requirements

The M.S. degree in Physics is designed to build a firm basis for later Ph.D. studies. The same curriculum has proved to be very valuable in many industrial jobs. About half of our M.S. graduates go into Ph.D. programs and half into industry.

Under the direction of the graduate adviser, a coherent program, directed toward the student's goal in graduate study and designed within the framework outlined below, is prepared and submitted to the department. There is a required core of 15 units of physics graduate courses (Physics 203A–B, 220A–B and 222), which are the same as the standard first-year courses required in most Ph.D. curricula. Three further units of graduate physics are required, which can be either thesis or independent study (see ***Note*** below). The other 12 units for the degree may be upper division physics, graduate physics or courses from some related field.

To summarize the required courses, 203A–B is advanced mechanics, (text, *Classical Mechanics* by Goldstein), 220A–B is advanced electricity and magnetism (text, *Classical Electrodynamics* by Jackson), 222 is advanced quantum mechanics (text, *Quantum Mechanics* by Schiff), 290 is independent study, and 299 is thesis, either experimental or theoretical. It is noteworthy that the texts are those standard across the country at major universities. For more exact descriptions, see the list of courses.

More than one-third of the program may be designed according to the specific interests of the student, in consultation with faculty. Our faculty is active in the fields of chaos theory, X-ray fluorescence, thin film studies, nuclear spectroscopy, Raman spectroscopy, and experimental and theoretical solid state physics. Recently improved laboratory facilities are available for student exploration of these and other fields, specifically including laser-based research in modern optics. Our computer facilities are excellent.

Undergraduate education equivalent to a physics major at CSU, Fresno is necessary for admission. Note the other requirements above under *Graduate Programs*.

	Units
Physics graduate courses: Phys 203A–B, 220A–B, 222 and at least 3 units of Phys 290 or 299	18
Electives in physics or related fields	12
Total	30

Note: Each student is required to complete as a culminating experience at least 3 units of Phys 290 (Independent Study) and a comprehensive written and oral examination, or at least 3 units of Phys 299 (Thesis).

Master of Arts Degree Requirements

The M.A. in Physics is a degree with a flexible curriculum, specifically intended for those who intend to become high school or junior college physics teachers, and for those who are already teaching in physics or some related field. Some teaching experience (either prior to or as part of the program) is required for the degree. The M.A. is also appropriate for many students intending to work in industry. It is not the optimum program for anyone intending to pursue a doctoral program in physics.

The M.A. curriculum offers an opportunity for students of diverse backgrounds to become competent in physics and to gain practical experience in teaching physics. There are several possibilities for the required teaching. Note the entrance requirements under *Graduate Programs*. It is understood that students who have not taken upper-division physics courses can expect to take longer to achieve the master's degree.

Under the direction of the graduate adviser, a coherent program, directed toward the student's goal in graduate study and designed within the framework outlined below, is prepared and submitted to the department. There must be at least 15 units of 200-series physics courses, including the culminating experience (see ***Note*** below), which leaves room for 5 additional units of upper division or graduate physics and 10 additional units in physics or related fields. It is expected that a substantial portion of the courses taken will be 275T (Topics courses), 290 (Independent Study), or 299 (Thesis).

	Units
Courses in physics, including 15 units in 200-series	20
Electives in physics or related fields	10
Total (minimum)	30

Note: Each student is required to complete as a culminating experience either at least 3 units of Phys 290 (Independent Study) and a comprehensive written and oral examination, or at least 3 units of Phys 299 (Thesis).

Physical Science

Some of the departments in the School of Natural Sciences offer courses in the physical science area. Some of these courses may be used to satisfy requirements for general education, credential programs, or professional development.

Physical Science Minor

The physical science minor offers an opportunity for both non-science and science majors to diversify into important and interesting fields. It consists of 21 units of courses selected according to one of the patterns below:

	Units
A. Chem 3A–B or 1A–B	7
Phys 2A–B or 5A–B	8
Upper-division electives	6
	21
B. Chem 1	3
Phys 2A–B or 5 A–B	8
Geol 1	4
Upper-division electives	6
	21
C. Chem 3A–B or 1A–B	7
Phys 10	4
Geol 1	4
Upper-division electives	6
	21

The upper-division electives may be any upper-division courses for which the student is qualified, from the three departments. Courses with very few prerequisites are Chem 139; Geol 105, 114, 151, 168, 169; Phys 145; P Sci 106, 168.

For chemistry, geology or physics majors, all courses must be outside the major department. The revised program must be approved by the chair of the major department.

Credential Program

See the coordinator for teacher education or the physics department chair.

COURSES

Physics (Phys)

2A. General Physics (4). Prerequisite: intermediate algebra. Topics and concepts in mechanics, properties of matter, energy, heat and sound. General Education BREADTH, Division 1. (3 lecture, 3 lab hours) (CAN PHYS 2)

2B. General Physics (4). Prerequisite: Phys 2A. Topics and concepts in light, electricity, magnetism, atomic structure, relativity, quantum nature of light and matter, nuclear structure and radiation. General Education BREADTH, Division 1. (3 lecture, 3 lab hours) (CAN PHYS 4)

5A. Principles of Physics I (5). Prerequisite: Math 76 (or concurrently). Topics and concepts in classical physics including statics, kinematics, Newton's laws, conservation laws, rigid body motion, simple harmonic motion, mechanics of solids and fluids, waves, sound, heat and thermodynamics. General Education BREADTH, Division 1. (4 lecture, 3 lab hours)

5B. Principles of Physics II (5). Prerequisite: Phys 5A, Math 77 (or concurrently). Topics in classical physics including electrostatics, electric fields, currents, magnetic fields, electromagnetic induction, Maxwell's equations, radiation, geometrical and physical optics. General Education BREADTH, Division 1. (4 lecture, 3 lab hours) (Note: Students who desire a survey of the entire scope of general physics should continue through Phys 102.)

10. Conceptual Physics (4). Prerequisite: intermediate algebra. Basic ideas of physics and their relationship to the everyday environment. Observation and interpretation of physical phenomena, identification and elimination of misconceptions, proper terminology for physical quantities, scientific method, metric system. Memorable demonstrations in the lectures and household-related experiments in the lab. General Education BREADTH, Division 1. (3 lecture, 2 lab hours)

90. Directed Study (1–2; max total 3). Prerequisite: any university-level physics course. Individually arranged course of study in some limited area of physics, either to remove a deficiency or to investigate in more depth. (1–2 hours to be arranged.)

99. Joy of Physics (1). Great experiments of physics; amazing demonstrations; science *vs.* pseudo-science; critical thinking. Required of all new and transfer physics majors, preferably during the first semester at CSUF. *CR/NC* grading only.

102. Modern Physics (3). Prerequisite: Phys 5B. Fundamental concepts of atomic and nuclear structure, transitions and radiation. Includes discussions of relativistic mechanics, quantum mechanics, solid state physics. Special topics as they pertain to modern developments in physics, engineering and chemistry.

104. Experimental Techniques in Solid State Physics (3). Prerequisite: Phys 5B. Basic concepts in solid state physics. Measurements of conductivity, energy gap in semiconductors, drift mobility, Hall coefficients, photoconductivity, magnetic susceptibilities, exciton spectra, dielectric loss. Experience in X-ray diffraction, vacuum technology, thin-film deposition and low temperature techniques. (1 lecture, 6 lab hours)

105A–B. Analytical Mechanics (3–3). Prerequisite: Phys 5B. (A) Analytical and vector treatment of the fundamental principles of statics, kinematics, and dynamics. (B) Advanced dynamics; harmonic motion, central force fields and Lagrange's equations.

107A–B. Intermediate Electricity and Magnetism (3–3). Prerequisite: Phys 105A, Math 81. (A) Mathematical analysis of electrostatics and magnetostatics, Gauss' law, solutions of Laplace's equation, images, theory of conduction, magnetic potentials. (B) Motion of ions in electric and magnetic fields, electromagnetic induction, Maxwell's equations and wave propagation, electron theory and magnetic properties.

110. Physical Optics (3). Prerequisite: Phys 5B, Math 81. Theory of optical phenomena; wave theory of light with applications to optical instruments; interference and diffraction phenomena, dispersion, polarization, coherence and laser phenomena. Practical experience in using lasers and optical instruments. (2 lecture, 3 lab hours)

115. Quantum Mechanics (3). Prerequisite: Phys 102, 105A, 170A (or concurrently), Math 81. Historical background, postulates, meaning and methods of quantum mechanics; applications to atomic phenomena.

116. Quantum Physics of Atoms (3). Prerequisite: Phys 115, or Chem 110B and permission of instructor, or Chem 215. Quantum mechanics applied to atomic and nuclear physics.

120A–B. Scientific Measurements and Instrumentation (3–3). Prerequisite: Phys 5B. Electronic measurements and the physics of modern analog and digital circuits used in general scientific instrumentation. (2 lecture, 3 lab hours)

125. Laboratory Instrumentation (3). (See Chem 125.) Not open to chemistry majors. Prerequisite: Chem 8 or 128A, Chem 105. Basic electricity, electronics, light and optical systems as applied to the design, use and limitations of instrumentation typical to the analytical and bioscience laboratory. (1 lecture, 6 lab hours)

130. Advanced Laboratory (2). Prerequisite: Phys 102, 120A. Advanced experiments in atomic and nuclear physics. Radiation safety. Gamma-ray, X-ray, and particle detection and spectroscopy. X-ray fluorescence analysis, Mossbauer, coincidence, Compton scattering and radiation attenuation experiments. Statistics, error analysis. Projects. (6 lab hours)

135. Physics of Medical Instrumentation (3). A course in diagnostic, emergency and laboratory instrumentation, designed for students and personnel in the medical, paramedical and biological fields with emphasis on electronic devices. The subject matter includes basic electronic principles, biomedical recording, oscilloscopes, electrocardiography, encephalography, fetal monitors, etc.

136. Radiation Physics (3). Prerequisite: Phys 102. The interaction of radiation with matter: photoelectric, Compton and pair production processes, neutron and charged particle interactions, linear energy transfer, quality factor, attenuation coefficients, shielding. Biological effects, RBE, internal dose, permissible exposures, beneficial application. Instrumentation.

140. Thermodynamics and Kinetic Theory (3). Prerequisite: Math 81. Fundamental concepts and laws of classical thermodynamics. Rudiments of kinetic theory and statistical

thermodynamics with application to physical and chemical systems.

145. Geophysics (3). Prerequisite: Phys 2A–B or 5A, Math 75. Basic principles of physics applied to the solution of geological problems, rotation and figure of the earth, the gravity field, seismology and the earth's interior, geomagnetism, and the thermal history of the earth.

162. Solid State Physics (3). Prerequisite: Phys 102, or Chem 110B and permission of instructor, or Chem 215. Classification of solids; crystalline state and lattice vibrations; properties of metallic lattices and dielectrics; magnetic properties of solids; free electron theory and band theory of metals; semiconductors; imperfections.

170A–B. Mathematical Physics (3–3). Prerequisite: Math 81. Application of mathematical methods to the solution of problems in physics.

175T. Topics in Contemporary Physics (1–4; max total 12). Designed to provide students with special work in such areas of physics as biophysics, modern optics, plasmas, high energy physics, solid state, chaos theory, nuclear structure, astrophysics, low temperature phenomena. Some topics may have labs.

180. Seminar in Physics (1; max total 3). Prerequisite: senior or graduate physics major or permission of department chairman.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

GRADUATE COURSES

(See Course Numbering System.)

203A–B. Theoretical Physics (3–3). Advanced treatment of classical analytical mechanics including Lagrange's and Hamilton's formulation of the laws of motion, special relativity, small oscillation theory, hydrodynamics.

207. Radiotracer Methodology in the Natural Sciences (3). (Same as Biol 207 and Chem 207.) See Biol 207 for description.) (2 lecture, 3 lab hours) (Former N Sci 207)

220A–B. Advanced Electricity and Magnetism (3–3). Electromagnetic theory and its applications; electrostatics, boundary-value problems in electrostatics, dielectrics, multipoles, magnetostatics, Maxwell's equations, electromagnetic radiation, optical properties of materials, wave guides and resonant cavities.

221. Atomic and Nuclear Physics (3). The nature of matter and radiation as deduced from the classical and quantum mechanical theories; atomic and nuclear structure; the nature of the nucleus as deduced from classical and quantum mechanical theories; models of nuclear structure. (Former Phys 221A)

222. Quantum Mechanics (3). Non-relativistic quantum theory; quantum mechanical pictures and representations, angular momentum, perturbation theory, applications to central force problems, scattering, solid state and atomic systems. (Former Phys 222A)

275T. Topics in Contemporary Physics (1–3; max total 6). Advanced topics in such areas as modern optics, plasma physics, high energy physics, solid state physics, astrophysics, nuclear physics, biophysics, relativity. Some topics may have labs.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

299. Thesis (2–6; max total 6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

PHYSICAL SCIENCE COURSES

Physical Science (P Sci)

ASTRONOMY

21. Elementary Astronomy (4). Prerequisite: intermediate algebra. Basic concepts, theories, history and laws of astronomy. Solar system, stellar evolution, quasars, pulsars, black holes, origin and development of the cosmos. Laboratory includes star and planet observation, lunar observation, physical principles particularly important for astronomy. General Education BREADTH, Division 1. (3 lecture, 2 lab hours).

22. Solar System Astronomy (3). Prerequisite: Phys 2A. Astronomical coordinate systems; astronomical instrumentation; planetary motion and Kepler's Laws; the planets; comets, meteors, and meteorites; the sun; and the solar wind.

23. Stellar Astronomy (3). Prerequisite: Phys 2A. Methods of measuring stellar distances, photometry, stellar spectra, H-R diagram, stellar structure, stellar evolution, the Milky Way galaxy, exterior galaxies, and cosmology.

103. Extraterrestrial Life (3). Contemporary astronomical theories of the evolution of galaxies, stars, and planetary systems with attention focused primarily on the question of whether or not life exists beyond the earth.

OTHER

106. History of Physical Science (3). The development of great ideas and discoveries in physical science from antiquity to the present; special emphasis upon early Greek scientific thought. General Education CAPSTONE Cluster.

168. Environmental Impact of Energy Demands by Society (3). Analysis of energy crisis; introduction to various forms of energy, energy conversion processes and environmental effects; present energy supply and energy projections; future energy demands and ways of evaluating alternatives. General Education CAPSTONE Cluster, Critical Thinking.

180T. Topics in Physical Science (1–3; max total 9). Detailed discussion of special topics within the realm of physical science.

IN-SERVICE COURSES

305. Physical Science for Secondary School Teachers (3; max total 6 in any one field). Prerequisite: secondary credential and two years of teaching experience. Objectives, content and instructional materials for the physical sciences; fundamental principles and recent developments. Emphasis may be on chemistry, geology or physics.

350. Physical Science for Elementary School Teachers (3–6; max total 6 in any one field). Maximum total credit 12 units; not more than 6 units in one field. Prerequisite: elementary credential. Selection of source materials and aids available for illustration of fundamental concepts and principles in physical science; laboratory work in construction, operation, and use of demonstrations and experiments in the elementary school.

Political Science

School of Social Sciences
Department of Political Science
Philip F. Beach, Chair
Social Science Building, Room 129
(209) 278-2988

City and Regional Planning Program
Wayne V. Merchen, Coordinator
Social Science Building, Room 120
(209) 278-3912

B.A. in Political Science
B.A. in Public Administration
Minor in Political Science
Minor in Public Administration
Minor in Urban Studies
M.A. in International Relations
Master of City and Regional Planning (M.C.R.P.)
Master of Public Administration (M.P.A.)



Courses and programs offered by the Department of Political Science are intended to help all students become more effective participants in a democratic society, as makers of public policy and as individuals affected by those policies. Our programs prepare political science and public administration majors for a wide variety of careers.

Students may elect to concentrate within Political Science on American government and politics, international politics, comparative government or political theory. The Public Administration Program is designed to prepare students for administrative positions in public service agencies and includes instruction in such subjects as personnel administration, budget preparation, public relations, and techniques of management appropriate to the administration of public policy. For those who achieve a high measure of proficiency in their undergraduate programs, the department offers advanced work leading to the master's degree in international relations, public administration, and city and regional planning. A minor in political science is chosen by students as a means of obtaining skills and knowledge important to their primary area of interest.

The urban studies minor is designed to provide exposure to the analysis of urban and regional problems and to serve as an excellent supplement to other academic degree programs offered throughout the university. A special major in urban studies may be designed to meet the needs of students with an interest in this area.

Internships

The department offers several programs through which students may gain practical experience while gaining academic credit. A Political Science internship involves working in the office of an elected official or, when possible, in an election campaign.

The comparable program in public administration and city and regional planning place students in positions, often paid, with local government offices and agencies where they may be involved with city planning and zoning issues, public relations efforts, special research topics or budget preparation, to mention several possibilities.

In addition, the department regularly sends selected students to the state capitol to participate in the Sacramento Semester Program under which they work with members of the Legislature, officers of the Executive or with lobbyists. Finally, arrangements also may be made for better students to serve as staff to members of congress in Washington, D.C. for a semester.

Career Opportunities

What do you do with a degree in political science or public administration? The skills gained through study on these subjects are highly valued in many areas, including business. Graduates have found positions with governmental agencies and officers, with companies or organizations that deal extensively with government or as members of the print and electronic media as reporters. Careers with the state department and foreign service have proven rewarding to many with a special interest in international politics or comparative government. Those interested in a career in the law have found a solid grounding in political science valuable. The department has more prelaw students as majors than any other program at the university.

City and Regional Planning graduates find careers in a wide variety of fields. Historically, the largest group has been employed in public agencies such as local planning and development departments or in transportation, housing, natural resource management, and economic development agencies at the state and federal level. Graduates have also found employment in specialized planning areas such as social and health service agencies and education services. Some have pursued careers in public administration and politics.

In the private sector there are opportunities for application of a wide variety of planning skills with planning consulting firms, environmental research groups, land development firms, building organizations, public utilities, real estate, architectural design firms, and in market analysis.

Faculty

Philip F. Beach, *Chair*

Don R. Broyles
Marn J. Cha
Alfred B. Evans Jr.
Russell C. Fey
Harold H. Haak
Lyman H. Heine Jr.
M. Jean Kingston
Russell J. Mardon
Wayne Merchen
Bernard E. McGoldrick
David H. Provost
John A. Rotstan
Karl A. Svenson
Harold Tokmakian
Freeman J. Wright

Political Science Advisers: Philip F. Beach, David H. Provost
Public Administration Advisers: John A. Rotstan, Freeman J. Wright
Prelaw Adviser: Karl A. Svenson
City and Regional Planning Program Coordinator: Wayne Merchen
Graduate Advisers: Marn J. Cha (M.P.A.), Freeman J. Wright (M.A.), Russell Fey, Wayne Merchen, and Harold Tokmakian (M.C.R.P.)

In most instances the faculty in the department have had experience practicing what they teach. All bring to their classes extensive backgrounds that permit them to combine the theories of political science, public administration, and planning with the practical applications of those theories. The faculty in planning are members of the American Planning Association and its professional arm, the American Institute of Certified Planners.

Most upper-division classes are small enough to allow extensive student-faculty interaction. The usual course involves a mixture of lecture and class discussion and encourages the expression of a variety of viewpoints about political issues. With smaller classes come greater opportunities for individualized instruction and assistance.

Bachelor of Arts Degree Requirements

Political Science Major

The requirements for the Bachelor of Arts degree in Political Science are:

	Units
1. Major requirements: (See notes 1 and 2)	36
a) Core: Pl Si 1, 90, 110 or 111, 120, 140, 150	(18)
b) Upper-division Political Science Electives: (exclude 101, 102, 187)	(18)
2. General Education requirement:	51
3. Electives and remaining degree requirements (see Degree Requirements); may be used toward a dual major or minor:	37
Total	124

Notes:

1. *CR/NC* grading is not permitted in the political science major.
2. Political science majors may not use Pl Si 1 or 120 for General Education BREADTH, Division 8.
3. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy political science major requirements.
4. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
5. The department highly recommends that the student select upper-division electives in at least three of the following disciplines: anthropology, African-American studies, economics, English, geography, history, Chicano and Latin American studies, philosophy, sociology, or city and regional planning. Consult adviser for specifically recommended courses.

Bachelor of Arts Degree Requirements

Public Administration Major

The requirements for the Bachelor of Arts degree in Public Administration are:

	Units
1. Major requirements: (See notes 1 and 2)	36
a) Core: Pl Si 1, 90, 181, 182	(12)
b) Upper-Division electives:	(24)
Elect from:	
1. Pl Si 110, 111, 114, 170	(3)
2. Pl Si 150, 151, 159T	(3)
3. Pl Si 160, 163, 169T	(3)
4. Pl Si 183, 188T, 189T	(9)
5. Pl Si 186, 187, 190, 191	(6)
2. General Education requirement:	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may include a dual major or minor:	37
Total	124

Notes:

1. *CR/NC* grading is not permitted in the public administration major with the exception of Pl Si 187.
2. Public administration majors may not use Pl Si 1 for General Education BREADTH, Division 8.
3. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy public administration major requirements.
4. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
5. The department highly recommends that the student select upper-division electives in at least three of the following disciplines: anthropology, African-American studies, economics, English, geography, history, Chicano and Latin American studies, philosophy, psychology, sociology, or city and regional planning. Consult adviser for specifically recommended courses.

Minors

The following minor requirements are in addition to the general education requirement in social science.

Political Science	Units
Pl Si 1, 110 or 111	6
Political Science electives (upper division), excluding Pl Si 101, 102, 158, 187	9
Electives (upper division) in anthropology, economics, English, geography, history, philosophy, psychology, or sociology	6
	21

Public Administration

Elect from Pl Si 1, 181, 182, 188T 12
Elect from Pl Si 110, 111, 114, 150, 151, 170 3
Elect from Pl Si 160, 163, 183, 189T 3
Electives (upper division) in anthropology, economics, English, geography, history, philosophy, psychology or sociology 3
21

Urban Studies *(Interdisciplinary)*

Coordinator: Wayne V. Merchen, City and Regional Planning Program.

Faculty Advisers: Mary A. Ludwig, Anthropology Department; Edward E. Nelson, Sociology Department; James S. Kus, Geography Department; John A. Rotstan, Political Science Department.

Required Courses	*Units*
*Concepts and Issues**	9
Anthropology 108, Urban Anthropology; Geography 160, Urban Geography; or Sociology 163, Urban Sociology	(3)
Political Science 169T, History of Urban Political Development or Political Science 181, Public Administration	(3)
City and Regional Planning 100, Introduction to Community Planning	(3)
*Analytical Methods**	6
Sociology 175, Social Research Methods; City and Regional Planning 103, Urban Design	
Electives:	6
With the approval of a program adviser, elect six units, with no more than three lower-division units and no more than three units from any one program, from the following list of courses: Anth 108, 172; Af Am 135; B A 120, 154; Crim 2, 10; Econ 40, 50; Eth S 1, 4; Fin 180, 186; Geog 109, 128, 146, 160; Hist 137; CLS 3; Pl Si 90, 103, 163; Soc 2, 25, 111, 131, 163; C R P 111, 135, 149T. Senior students may elect internship by registering for S Sci 185, 1 to 3 units.	
Total	21

* Students with a course equivalent to one in this category, taken in their major, may, with the approval of a program adviser, substitute additional units from the electives below for the units required here.

United States Constitution Requirement

The United States Constitution (including California State Constitution and local government) requirement for graduation should be fulfilled by Pl Si 2 or 101. Pl Si 1 does not fulfill the United States Constitution requirement.

Credential Program

See Social Science Major for the Single Subject Waiver program in social science.

Master of Arts Degree In International Relations

The program leading to a Master of Arts degree in International Relations is designed chiefly, but not exclusively, for students preparing for careers involved with global and international politics (e.g., political aspects of: international business, agriculture, health services, education, U.S. foreign service, etc.). The interdisciplinary nature of the program is derived from: (1) the five seminars in Political Science each of which requires the student to master concepts and materials from other disciplines closely related to global politics, and from (2) the nine-unit component of the program which each student selects from the approved list of extra-departmental courses related to his or her career objectives.

The program's flexibility, however, also accommodates the needs of those students who plan to use the master's degree for teaching careers or to pursue a Ph.D. in political science, or both. After completion of 15 of the required 30 units of the program, each student is requested to submit to the graduate adviser a written statement of career objectives so that remaining requirements may be tailored to the needs and desires of the individual.

Requirements for Master of Arts In International Relations

Admission to the program is open to all graduates of a duly accredited college or university who meet the requirements for admission (see *Admissions*). Students with background deficiencies in political science usually may remedy these through a few upper-division political science courses selected by the program adviser. Any prerequisites required by extra-departmental courses must also be fulfilled unless waived by the department or program concerned.

All candidates for the Master of Arts degree in International Relations must complete the 15 units of graduate seminars specified as the core program, which consists of Pl Si 200, 210, 220, 240 and 250. Nine units of approved electives from outside the department are also required along with an additional 6 units within the discipline of political science.

The additional 6 units of political science may be earned in one of the following four ways, depending on the interests and career objectives of the candidate:

A. Students declaring their intention to pursue a Ph.D.: a master's thesis amounting to 6 units of credit is required.
B. Students declaring their intention to teach political science at other than the university level may meet the 6-unit requirement by:
   (1) thesis, or
   (2) project equivalent to 6 units of thesis.
C. Students declaring their intention to pursue careers in fields other than political science may meet this 6-unit requirement by:
   (1) thesis, or
   (2) approved project equivalent to 6 units of thesis, or
   (3) 6 units of additional coursework in political science and written comprehensive examination.
D. Students declaring their intention to pursue a career in the U.S. Foreign Service or other governmental agencies and international organizations may meet this 6-unit requirement by:
   (1) thesis, or
   (2) approved project equivalent to 6 units of thesis, or
   (3) 6 units of additional coursework in political science (courses must be in international relations and/or comparative politics) and written comprehensive examination.

A thesis or project must be primarily in the field of international relations and under the direction of the political science department. One reader or assistant project adviser may be chosen from outside Political Science where the topic makes this appropriate.

Exclusive of the core courses and thesis or project, a maximum of 3 units may be gained through Independent Study. Basic competence in written translation from a foreign language into English is a prerequisite for the M.A. degree in International Relations. This language examination will be required before enrollment in the thesis or taking the written comprehensive examinations. Foreign students may offer English in fulfillment of this requirement.

Specific Requirements for M.A. in International Relations: One of the following plans is available to the student in consultation with the graduate adviser:

Plan A (Students declaring their intention to pursue a Ph.D.)

	Units
1. Core Program	15
2. Thesis	6
3. Elective from approved list of extra-departmental courses	9
Total	30

Plan B (Students declaring their intention to teach political science at other than university level)

1. Core Program	15
2. Thesis or Project	6
3. Electives from approved list of extra-departmental courses	9
Total	30

Plan C (Students declaring their intention to pursue careers outside political science)

1. Core Program	15
2. Thesis, project, or six additional units of course work in political science	6
3. Electives from approved list of extra-departmental courses	9
4. Written examination if 6 additional units in political science are chosen	
Total	30

Plan D (Students declaring their intention to pursue a career in the United States Foreign Service)

1. Core Program	15
2. Thesis, project, or six units of electives in political science drawn from the International Relations and/or comparative Government series	6
3. Electives from approved list of extra-dept'l courses	9
4. Written examination if 6 additional units in political science are chosen	
Total	30

Graduate Public Administration Program

The Graduate Public Administration Program offers a multi-discipline Master of Public Administration (MPA) degree. The MPA program is built on the belief that effective leadership of public agencies requires a basic set of abilities and public values irrespective of the particular characteristics of the agency. Consistent with this belief, all students in the program complete a common core program of 18 units within the 36 units required for the MPA. The remaining 18 units the student will select, in consultation with his or her adviser, from graduate public administration courses and courses offered by other departments and programs. These 18 units can be used to further develop a general competence in public administration or to provide the student with a specialization suitable to public administration. To finish the program a student may elect to write a thesis or to take a comprehensive examination. The entire program can be completed by taking courses at night and on weekends.

The curriculum of the program follows the guidelines established by the National Association of Schools of Public Affairs and Administration (NASPAA) and was designed following consultation with over a dozen senior public administrators in the Fresno area. Consistent with the NASPAA guidelines, the program seeks to prepare administrative specialists who understand the place and role of public agencies and their staffs in the political, social, and economic systems of the United States; who have the analytic tools, both quantitative and qualitative, to diagnose problems and analyze alternative courses of public action; who have the leadership abilities to develop and make effective use of the talents and abilities of agency staffs; who have the abilities required to formulate, implement, and evaluate public policies which are responsible and effective; and who are able to manage an agency in such a way as to make responsible and efficient use of its resources now and in the future.

Curriculum for the Master of Public Administration Degree

	Units
Core: GPA 120G, 200, 210, 240A, 240B, 260	18
Subcore: GPA 225 or Bus 261, GPA 230, 250, 280T, Bus 250	3–12
Approved electives or additional subcore	3 or more
Practitioner's Seminars: GPA 289T	0–6
Thesis or comprehensive examination	0–3
Minimum Total	36

All students must take 18 core units, and either six subcore units or three subcore units and three units of GPA 289T. The remaining 12 units may be used to take additional subcore courses, additional GPA 289T, approved electives, or a combination of subcore, GPA 289T, and electives. Elective courses may be used to fulfill a specialization appropriate to public administration. The courses to be used for the specialization are to be chosen in consultation with the student's adviser and must be approved by the MPA program director.

In considering specialization or elective courses the following regularly offered courses can be considered by appropriately prepared MPA candidates: City and Regional Planning 200, 202, 204, 215; Criminology 203, 252, 255; Health Science 210, 213; Nursing 226, 240; Political Science 210, 240, 250; Social Work 200, 203, 240, 244, 246, 247; and Speech 268. There are numerous other specialization and elective courses potentially suitable for MPA candidates, please consult adviser.

Admission. Applicants may qualify for admission to the program and thereby take program courses by achieving classified graduate standing. Classified standing requires:

1. An acceptable baccalaureate degree from an institution accredited by a regional accrediting association;
2. Good standing at the last college attended;
3. Submission to the university of transcripts of college work; scores from the Graduate Record Examination Aptitude Test (GRE) or the Graduate Management Admission Test (GMAT); a written statement indicating why the applicant wishes to pursue an MPA degree; and, if any, evidence of work performance in a public or nonprofit agency (see 4 (d) below).
4. Recommendation for admission by the Admissions Committee of the Graduate Public Administration Program. Candi-

dates will be recommended on the basis of the promise they show for successfully completing the program and achieving a successful career in public management and administration. Candidates will be evaluated using a combination of (a) grade point average (those with averages of less than 2.75 overall or 3.0 on the last 60 semester units attempted must have compensating strength in other areas); (b) aptitude for academic work (those with scores of less than 475 on either part of the GRE or on the GMAT must have compensating strength in other areas); (c) professional goals of the applicant; and (d) successful performance in public or nonprofit agency employment as demonstrated by the character of work accomplished, distinctions achieved, and letters of recommendation from persons who can knowingly and comparatively evaluate the on-the-job performance of the candidate over a period of time (this basis for evaluation may be waived for candidates showing great strength in (a) or (b) above). Applicants whose native language is not English must also achieve a minimum score of 550 on the Test of English as a Foreign Language.

5. Applicants, otherwise admissible to classified standing, who have not been employed full-time for at least six months in a public or nonprofit organization nor completed a supervised internship of at least 120 hours in such an agency, will be allowed to take courses for one semester as a conditionally classified student. PI Si 186–187 (5 units) internship experience must be completed before enrollment in second semester courses.

City and Regional Planning Program

The Master's Degree Program in City and Regional Planning (MCRP) is designed as preparation for a professional career in planning at a responsible level. Emphasis is on the development of a general theory and philosophy of planning applicable to a wide variety of public and private institutions. Undergraduate degree programs in fields related to planning, such as anthropology, geography, political science, public administration, economics, sociology, social welfare, architecture, landscape architecture or engineering provide a suitable background for the MCRP degree program. Degrees in other fields also may be found acceptable following an evaluation of the candidate's records and career goals.

The central San Joaquin Valley provides a variety of settings for individual and class studies. The rich agricultural area with many small service communities, the multiple use areas of the Sierra Nevada, and the diverse neighborhoods and cultural groups of the Fresno metropolitan area are representative of the varied-environments in which graduates will work.

Two paths leading to a Master of City and Regional Planning degree are offered: a thesis program and a non-thesis program. The first is designed for the student who wishes to pursue significant independent research as a part of the graduate program; it also serves as preparation for additional graduate work at the doctoral level. The non-thesis program provides an opportunity for applied research and problem-solving at the city and regional scale as preparation for professional practice.

The 48-semester unit program is composed of a planning core and related supportive electives. In the first year, students follow a sequence which builds a common body of knowledge in planning theory, research methods, design, management, and professional practice. Special opportunities for practical experience are provided through practicum projects involving clients from surrounding communities and required internships in a variety of planning related offices. Beginning with the second semester, and continuing into the second year, students are encouraged to develop an elective sequence which focuses on their area of interest.

Curriculum for the Master of City and Regional Planning Degree

Each applicant for admission to the City and Regional Planning program is evaluated on the basis of academic record, educational and vocational background, performance on the Graduate Record Examination Aptitude Test, and commitment to planning as a profession. Prospective students must make arrangements for a personal interview with a faculty member as a part of the admission process. Students outside the central San Joaquin Valley should consult the department for alternative procedures. (Applicants must first meet the standards of the university and the Division of Graduate Studies and Research. See *Division of Graduate Studies and Research, Admission to Graduate Standing, Advancement to Candidacy, Program Requirements, and Thesis and Thesis Alternatives.*)

Under the supervision of a faculty adviser, each student submits an approved program within one of the following frameworks:

Plan A — Thesis Program	*Units*
Core curriculum (see specific requirements)	31
Elective Sequence (see elective sequence)	11
Thesis	6
Total	48

Specific Requirements: C R P 200, 201A–B, 202, 203A–B, 204, 215, 280T, 299, and an approved course in management and budgeting.

Plan B — Non-Thesis Program	*Units*
Core curriculum (see specific requirements)	31
Elective Sequence (see elective sequence)	17
Total	48

Specific Requirements: C R P 200, 201A–B, 202, 203A–B, 204, 215, 280T, and an approved course in management and budgeting. Each candidate for the MCRP under Plan *B* must successfully complete a comprehensive examination covering both the central concepts and techniques of city and regional planning and the elective sequence.

Other Requirements and Limitations

Soc 25, A S 153 or an equivalent course in statistical methods and C R P 109GT, Computers in Planning, or equivalent course or practical experience in personal computer applications must be completed with a mark of *CR* or *C* or better prior to or concurrently with enrollment in a required graduate research methods class. Such courses may not be utilized as electives in a planning program. Remedial writing classes required by the program and International Studies courses required of foreign students by the university may not be utilized as electives toward the MCRP.

Elective Sequence

Each student, in consultation with a faculty adviser, develops an elective sequence of courses acceptable to the program which focuses on an area of interest. Suggested areas include community planning practice, environmental analysis/design, and public administration. Other focuses may be developed under the direction of a faculty adviser. A recommended program for a 12 unit elective sequence in public administration is as follows: GPA 210, 240A–B, and 260 (GPA 120G and GPA 200 may be taken as a part of the City and Regional Planning core program.)

COURSES

Political Science (Pl Si)

1. Modern Politics (3). An introduction to modern politics through the study of subjects such as political interests, parties, and movements; democracy, communism, and nationalism; the individual and the state; power and government. General Education BREADTH, Division 8.

2. American Government and Institutions (3). Meets the United States Constitution requirement and the federal, California state and local government requirement. Not open to students with credit in Pl Si 101. The development and operation of government in the United States; study of how ideas, institutions, laws, and people have constructed and maintained a political order in America. General Education CORE. Not available for *CR/NC* grading. (CAN GOVT 2)

8. Human and Civil Rights (3). Examination of the ethical, ideological, religious and legal foundations of human and civil rights; development of human rights in the Western and non-Western world; the nature and manner of discrimination and oppression; protection and enforcement of civil and human rights. General Education BREADTH, Division 8.

10T. Contemporary Issues in Politics (1-3; max total 9 if no topic repeated). Significant contemporary uses in political theory, world politics, comparative government, American government, local government, public administration, or public opinion.

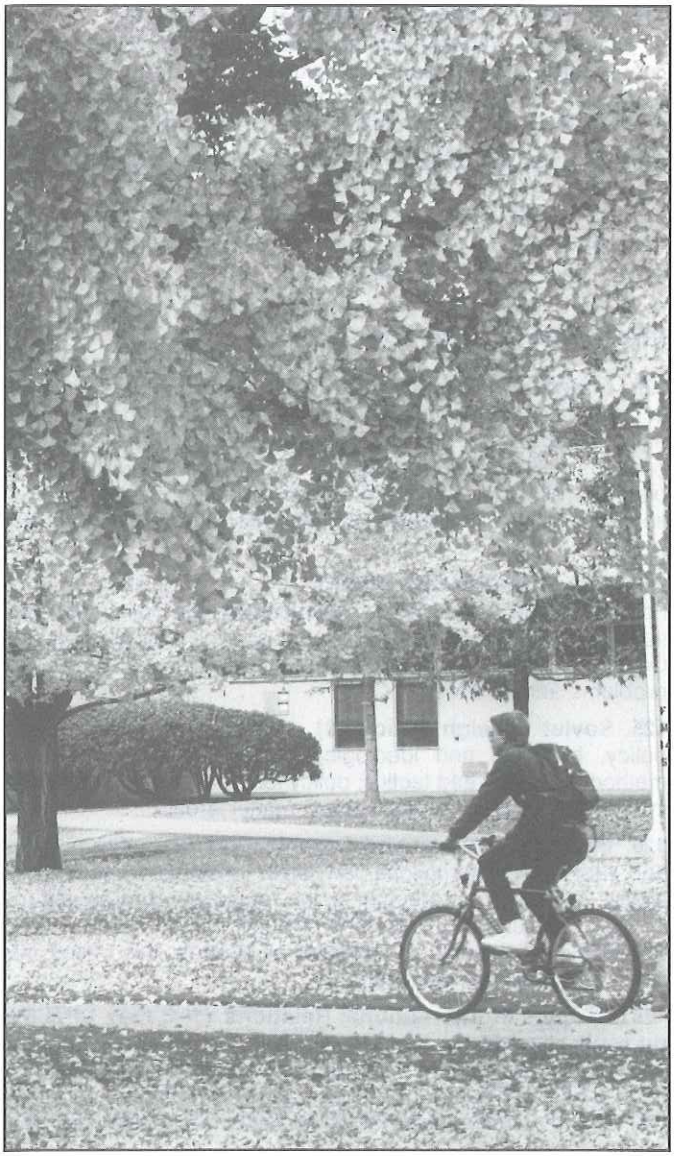
70. Introduction to Law (3). Examination of roles and functions of law; jurisprudence (theory of law); legal education and the court system — structure and rationale; criteria for selecting judges; factors influencing judicial decisions; resistance and compliance; changes and challenges to the judicial system.

90. Methods of Analysis of Quantitative Political Data (3). An introduction to hypothesis testing in political science, with applications to the analysis of quantitative political data; the formulation of research problems and hypotheses; accuracy and precision in measurements; problems of evidence and inference; basic techniques of statistical analysis.

101. American Constitution, Institutions and Ideals (3). Meets the United States Constitution requirement. Not open to students below second semester sophomore or with credit in Pl Si 2. Executive, legislative, and judicial functions of our government under the constitution; federal, California state and local governmental relationships. General Education CORE. Not available for *CR/NC* grading.

102. California Government and Institutions (1). Not open to students with credit in Pl Si 2, 101. Open only to students who have satisfied United States Constitution requirement but have not satisfied California state and local government requirement. Examination of legislative, executive, judicial, and local government problems in California. Not available for *CR/NC* grading.

103. California Politics (3). Satisfies California state and local government requirement, if not used for political science major. Emphasis on the historical development of politics in California and the factors and institutions important to contemporary politics: characteristics of the electorate, voter registration, primaries and general elections, candidates and campaigning, party organizations and leaders, interest groups, and current issues. General Education CAPSTONE Cluster.



Political Theory (Pl Si)

110. Seminar in History of Political Thought to Machiavelli (3). Development of political thought from Plato to Machiavelli: law, justice, the state, authority, forms of government, and church-state relations in light of the philosophy of history.

111. Seminar in History of Political Thought Since Machiavelli (3). Freedom and individual rights, democracy, majority rule, equality, law and authority, power, constitutionalism, property, social class and structure, and revolution traced through the writings of Hobbes, Locke, Rousseau, Hume, Burke, Bentham, Hegel, Tocqueville and Mill.

112. Politics and Christianity (3). (Same as A Eth 104.) Inquiry into major facets of Christianity as an integral part of the Western humanistic tradition of politics. Emphasis on Christian theories of man, the state, freedom and democracy. Politics to be interpreted in the broadest sense of all human association in pursuit of power, order, art, science and culture. General Education CAPSTONE Cluster.

114. Seminar in American Political Thought (3). Analysis of democracy, majority rule and minority rights, constitutionalism, federalism, representation, pluralism, property, separation of powers, and judicial review based on the perspectives of representative early and contemporary American thinkers.

119T. Topics in Political Theory (1–4; max total 8). Possible topics include theories of democracy; the Marxian tradition; political thought of specific authors, historical periods and countries; peace and war; church-state relations; the nature of politics and of political science.

International Relations (Pl Si)

120. International Politics (3). Dynamics of political interactions of nations; nationalism, imperialism and interdependence; national power and diplomacy; types of conflict, including war; peaceful settlement of disputes; current issues involving competing foreign policies, national development, energy and national liberation movements. General Education BREADTH, Division 8.

121. American Foreign Affairs (3). Prerequisite: Pl Si 2. Formulation and execution of American foreign policy; constitutional framework; role of the President and the executive branch, Congress, pressure groups and public opinion; contemporary problems and policies.

125. Soviet Foreign Policy (3). Sources of Soviet foreign policy, historical and ideological; continuity and change in methods, strategy and tactics; policy formulation and application in specific geographic and subject matter areas.

126. International Law and Organization (3). The sources and subjects of international law; state jurisdiction and responsibility; international agreements; the regulation of force and the peaceful settlement of disputes through international law and organization, including the League of Nations, the United Nations, and regional organizations.

128T. Topics in International Relations (1–4; max total 8 if no topic repeated). Politics of military power; arms limitation and control; peace theory; ecopolitics; regionalism and cooperation; shifts in balance of power; nationalism; imperalism; neutralism and nonalignment; foreign policies of specific nations.

Comparative Government (Pl Si)

140. Approaches to Comparative Politics (3). Prerequisite: Pl Si 1. Exploration of theories, models, and conceptual frameworks for the comparative study of political systems and subsystems; methodological rather than an area emphasis.

141. Soviet Politics (3). Government and politics of the Soviet Union. Soviet Marxist-Leninist ideology; the Communist Party in the Soviet political system; the structure and operation of governmental institutions; contemporary policies and policy problems. General Education CAPSTONE Cluster.

142T. Area Studies in Western Europe (1–4; max total 8 if no topic repeated). Government and politics of Western Europe (Britain, France, Germany, and Italy), Northern European Countries (Finland, Denmark, Norway, Sweden); or government and politics, of selected countries.

143T. Area Studies in Eastern Europe (1–4; max total 8 if no topic repeated). Government and politics of Eastern Europe; or government, politics, and institutions of selected countries.

144T. Area Studies in Africa and Middle East (1–4; max total 8 if no topic is repeated). Government and politics of Sub-Sahara Africa, Middle East; or government, politics, and institutions of selected countries.

146T. Area Studies in Latin America (1–4; max total 8 if no topic repeated). Possible topics include politics of South America; politics of Central America and Caribbean countries; roles of selected groups in Latin American politics.

149T. Seminar in Comparative Government (1–4; max total 8 if no topic repeated). Parliamentary systems, problems and goals of developing nations, federal systems, comparative local government, parties and pressure groups, and multi-party systems.

American Government (Pl Si)

150. Public Policy Making (3). The relationship of persons, groups, and institutions to the making and implementing of public policy in the United States; consideration of the participants and the modes of analysis and thought influencing public policy. General Education CAPSTONE Cluster.

151. Political Participation and Political Parties (3). Political parties; nature and extent of citizen political activity; election of public officials; political organization of government.

156T. Topics in Political Behavior (1–4; max total 8 if no topic repeated). Voting behavior, political alienation, leadership, political perceptions and knowledge, environmental effects on political participation, group processes, and political socialization.

157. Political Science Internship Seminar (2). Pl Si 158 concurrent enrollment. Advanced analysis of citizen-government linkage from a theoretical perspective.

158. Internship in Political Science (2–6 max total 6). Concurrent enrollment in Pl Si 157 (may be waived if student has completed one or more upper-division courses in American or California government), permission of instructor. Maximum credit toward the political science major, 3 units. Supervised work experience in legislative offices and/or political campaigns to provide student with an opportunity to fuse theory and practice. *CR/NC* grading only.

159T. Seminar in American Government and Politics (1–4; max total 8 if no topic repeated). Congressional committee operations, policy making by the courts, political implications of civil service, executive initiation of legislation, minority groups and politics, political implications of news reporting; jurisprudence and legal philosophy; legal institutions; conflict resolution.

Local Government (Pl Si)

160. State and Local Governments (3). The organization, structure, powers, and functions of state and local governments.

163. Municipal Government (3). Organization, powers, and functions of city government; types of city charters, relationship between city and state government; police and fire protection, education, water supply, health and sanitation, city planning, debts and taxation, public utilities.

169T. Seminar in Metropolitan Government and Politics (1–4; max total 8 if no topic repeated). Regional and area intergovernmental relations, urban renewal, human relations agencies, and taxation methodologies.

Public Law (Pl Si)

170. Constitutional Law, the Federal Structure (3). Judicial Review, Separation of Powers, Federalism and the Commerce clause through leading Supreme Court Decisions.

171. Constitutional Law, Civil Liberties and Civil Rights (3). Freedom of Expression, Freedom of Religion, Due Process of Law, and the Equal Protection of the Law through leading Supreme Court Decisions.

179T. Seminar in Public Law (1–4; max total 8). Administrative law, international law, judicial administration, jurisprudence, legal institutions.

Public Administration (Pl Si)

181. Public Administration (3). General analysis of the field of public administration; administrative theories; policy and administration; behavioralism; budgeting, planning, and legal framework.

182. Administrative Analysis: Management and Organization (3). Administrative organization; methods; systems and procedures; problem solving; systems analysis; reports and records; resources management.

183. Comparative Administration (3). Theories of comparative public administration; cross-national comparisons of administrative processes; institutions, policy formation, and behavior with consideration of cultural, social, and economic environments.

186. Public Administration Internship Seminar (2). Prerequisite: Pl Si 181. Seminar to be taken concurrently with Pl Si 187. Advanced analysis of public administration theory and administrative practices from a theoretical perspective.

187. Internship in Public Administration (2–6 max total 6). Concurrent enrollment in Pl Si 186 (may be waived if student has completed one or more upper-division courses in public administration or is concurrently enrolled in Pl Si 181), permission of instructor. Maximum credit toward public administration major, 3 units. Supervised work experience in public agencies to provide the student with an opportunity to fuse theory and practice. *CR/NC* grading only.

188T. Topics in Public Administration (1–4; max total 9 if no topic repeated). Treatment of current topics and problems in fiscal administration, public personnel administration, and planning.

189T. Seminar in Public Administration (3; max total 6 if no topic repeated). The values and philosophy of administration; management and dynamics of change; public relations and communication problems in public administration; planning problems and techniques; systems approach to resource management.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

191. Directed Readings (1). Directed readings and supplemental and original source material for enrichment of regular offerings in the subdiscipline.

Core Program for Master of Arts Degree in International Relations, (Pl Si)

200. Seminar in Methods and Political Systems (3). Prerequisite: permission of instructor. Systematic analysis of major political cultures and economic systems. Emphasis upon the leading theoretical models of the contemporary international system, issues of political economy, and methods of cross-cultural research.

210. International Relations and Political Theory (3). (Same as A Eth 201.) Prerequisite: permission of instructor. Inquiry into philosophies of international relations with particular emphasis on moral foundations of international law in light of Western Political Theory. Some contemporary problems selected for in-depth analysis and student research.

220. Seminar in Politics and Conflict (3). Prerequisite: permission of instructor. Analysis of sources of political conflict and methods of conflict resolution with application to selected topics, such as the foreign policy of major powers, the dynamics of political transformation, interaction in regional subsystems, or national defense and arms control.

240. Seminar in Politics of Resources and Modernization (3). Prerequisite: permission of instructor. Analysis of global interdependence and national examples in selected resource areas. Emphasis on approaches to modernization in developing nations and relations between rich nations and poor nations.

250. Seminar in Politics and Policy (3). Prerequisite: permission of instructor. Policy formulation, implementation and evaluation from a comparative perspective. Examines substantive policy issues common to modern industrial and developing nations from the perspectives of policy analysis and decision-making; considers the role of bureaucracy, the welfare state, political economy and competing ideologies.

290. Independent Study (3). See *Academic Placement — Independent Study*. Approved for *SP* grading.

298. Project Equivalent to Thesis (6). See *Criteria for Thesis and Project*. Significant undertaking of a pursuit appropriate to international politics. Must demonstrate originality and independent thinking and be accompanied by written scholarly apparatus. Project examples: documentary film; extensive curricular design; computer design of military strategies. Approved for *SP* grading.

299. Thesis (6). See *Criteria for Thesis and Project*. Approved for *SP* grading.

Graduate Public Administration (GPA)

120G. Quantitative Applications for Public Administration (3). The gathering, evaluation, and use of quantified information in the design and evaluation of programs and administrative activities. Data collection; measurement; sampling; data analysis, including regression, structural equation models, and linear programming; computer applications. (Former GPA 220)

200. Administration and Society (3). How administration acts and is acted upon by institutional forces and values; role of history, cultural, ethical, political, social and economic values and institutions; an emphasis on: bureaucracy, economy and democracy, centralization vs. decentralization, professionalism and society; alternatives to bureaucracy.

210. Public Organization Behavior and Dynamics (3). A study of how human behavior, motivations, personality, interpersonal and group dynamics operate in complex organizations; an emphasis on management styles, planned change, organization development, conflict management, leadership and communication skills.

225. Accounting for Public Management (3). (Students contemplating additional courses in Accounting should enroll in Bus 205.) Concepts, principles, and practices of accounting applicable to the administration of public programs and agencies. Current practices in recording and valuation. Analysis and interpretation of financial statements. Budgeting, internal reporting, and management controls.

230. Public Revenue and Expenditure Analysis (3). Prerequisite: Econ 40 and 50 or permission of instructor. The use of economic analysis in the resolution of major problems in revenue collection and expenditure choices. Critical examination of: burdens and effectiveness of taxation measures; conflicts between efficiency and equity; users charges; cost calculations; and cost-benefit analysis.

240A. Public Management Methods and Processes (3). A survey of theories, concepts and methods of public management; an integrated overview of the role of budget, revenue analysis, accounting, auditing, human resources planning, information systems, organization methods, human behavior, values in management functions and processes.

240B. Public Management Methods and Processes (3). Prerequisite: GPA 120G, 240A. An in-depth analysis of selected topics, issues and methods in public management; such as resource management, systems analysis, productivity analysis, project management, needs assessment, conflict resolution, attitude and opinion evaluation, administrative law, and communications.

250. Ethics and Public Administration (3). (Same as A Eth 202.) Prerequisite: GPA 210. The moral dimensions of public administrative decision-making. The nature of public and private morality; psychological and ethical egoism; relativism; utilitarianism and deontological theories; rights and goods in the public service context; sensitive applications of rules in public agencies.

260. Public Policy Administration (3). Prerequisite: GPA 120G, 200, 210, 240A. A study of policy initiation, formulation and implementation and a public manager's role in them; management processes and functions in the policy process; policy justification and advocacy, policy analysis, and implementation evaluation.

280T. Topics in Public Administration (3; max total 6 if no topic repeated). Selected topics meeting student needs and interests that are not met in other university courses.

289T. Practitioner's Seminar (1; max total 6 if no topic repeated). Prerequisite: Some seminars may have course prerequisites. Selected topics in the administration of public programs and agencies examined from the prospective and experience of practitioners.

290. Independent Study (1–4; max total 6). See *Academic Placement — Independent Study*. Approved for *SP* grading.

299. Thesis (3). Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the Master's degree. Approved for *SP* grading.

City and Regional Planning (C R P)

100. Introduction to Community Planning (3). Prerequisite: junior standing. Introduction to and critical analysis of theory and practice of community planning; traditional and alternative roles of planning in contemporary society; perspectives on community problems; evaluation of concepts, literature, and history. General Education CAPSTONE Cluster, Critical Thinking. (Former U R P 100)

103. Introduction to Urban Design (3). Suggested for graduate students emphasizing design. Prerequisite: junior standing. Introduction to physical design and environmental communication. Urban design principles and application; formulation of design programs and solutions; supervised studio projects. (two 3-hour studios) (Former U R P 103)

110T. Topics in Urban Planning Techniques (1–3; max total 6). Selected topics such as analytical techniques; means for management of urban development, including transportation, public facilities, and activities in the private sector; public policy concerning issues of local and regional significance. (Former U R P 110T)

111. Planning for Historic Preservation (3). The implementation of planning policy, guided by the General Plan and its Historic Preservation element, utilizing the techniques of historic preservation to achieve the broad public goal of rehabilitation and conservation of older areas of a community. (Former U R P 111)

135. Environmental Law (3). Contemporary environmental problems and their interrelationships. The conceptual, constitutional and administrative framework for environmental protection and management. Legislation and case law for the protection and enhancement of the environment with emphasis on natural resources. General Education CAPSTONE Cluster, Critical Thinking. (Former U R P 135)

149T. Topics in Environmental Design (3; max total 6). Prerequisite: junior standing. Selected topics on factors that influence environmental design problems, including environmental crisis areas and impact of public policies; design framework formulation and problem solving needed to achieve a quality environment. (Former U R P 149T)

190. Independent Study (1–3; max total see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading. (Former U R P 190)

191. Directed Readings (1–3; max total 6). Supervised independent reading in a selected topic related to city and regional planning. (Former U R P 191)

GRADUATE COURSES

(See *Course Numbering System.*)

109GT. Presentation Techniques in Urban and Regional Planning (1; max total 3). Concurrent enrollment in C R P 200 series courses. Topics in techniques and practice of oral, narrative and graphic presentation as related to city and regional planning. (One 2-hour lab) (Former U R P 109GT)

200. Seminar in Planning Theory and Process (3). Prerequisite: permission of instructor. Pursuit and analysis of the essence of planning, study of traditional and contemporary theories of community development, the planning process. (Former U R P 200)

201A–B. Seminar in Planning Research (3–3). Prerequisite: permission of instructor. (A) Planning research methodology and technique including scientific method, statistical analysis of data sampling, regression analysis; application of computer technology; sources of data. (B) Application of research methodology and technique to planning problems; special emphasis on the formulation of research designs. (Former U R P 201 A–B)

202 Seminar in Urban Design (3). Prerequisite: permission of instructor. Examination of urban design theory and principles, with attention to design philosophy and the underlying concepts that include man-environment relations, design communications, the design process; implementation techniques; case studies. (Former U R P 202)

203A–B. Practicum in Community Planning (3–3). Prerequisite: permission of instructor. (A) Studio and field project design and implementation methods; supervised projects; (B) Application of theories and principles to a team project. (Former U R P 203A–B)

204. Seminar in the Elements of Community Structure (3). Prerequisite: permission of instructor. Analysis of the characteristics and interrelationships between selected elements of the physical structure of the community including land use, transportation, housing, and public facilities. (Former U R P 204)

212T. Seminar: Topics in Urban Development (3; max total 9). Prerequisite: C R P 200. Selected topics in the application of public policy to the solution of urban problems, including the renewal of blighted areas, the conservation and preservation of historic areas, the development and financing of new communities. (Former U R P 212T)

215. Seminar in Land Development Controls (3). Prerequisite: C R P 200. The application of the police power — zoning, subdivision regulations and other techniques — used to implement land development plans and policies; historical and contemporary case studies. (Former U R P 215)

220. Seminar: Planning for Housing (3). Prerequisite: C R P 200. Housing problems in America; the role of local, state and federal government and private enterprise; planning for adequate housing, carrying out policies and programs. (Former U R P 220)

230. Seminar in Planning for the Region (3). Prerequisite: C R P 200. Regional planning — approaches and methods; goal and policy implications of resource development, utilization and conservation; strategies for planning; case studies. (Former U R P 230)

236. Seminar in Environmental Impact Assessment (3). Prerequisite: permission of instructor. Environmental impact assessment as a procedure to protect and enhance the quality of the environment; the legal framework; content and preparation of the EIS/EIR; long-range planning for environmental protection; case studies. (Former U R P 236)

239T. Seminar in Regional and Environmental Planning (1–4; max total 12). Prerequisite: permission of instructor. Selected topics in regional and environmental planning, including land, air and water resources; consideration of federal, state, and local environmental laws and policies; case studies. (Former U R P 239T)

249T. Topics in Environmental Design (1–3; max total 9). Prerequisite: C R P 202. Selected topics such as man- environment relations; site planning; the development of community form; physiographic and cultural influences on urban design; problems in policy making, implementation, and controls; cognitive mapping; design of prototypical environments. (2 hours studio weekly per unit) (Former U R P 249T)

250. Seminar in Transportation Planning (3). Prerequisite: permission of instructor. A systems view of transportation; alternative modes; interrelationships with urban structure; models; policy implications. (Former U R P 250)

260T. Seminar: Topics in Urban Development Process (1–3; max total 9). Prerequisite: permission of instructor. Selected topics such as theory of regional and urban spatial organization; theory of modeling and gaming simulation; application of modeling and simulation techniques to the urban development process; case studies, supervised projects. (Former U R P 260T)

280T. Professional Planning Practice (2–4; max total 7). Maximum total 7 units applicable toward the degree, provided that units in excess of 4 must be earned in topics taken concurrently with related elective seminar. Prerequisite: C R P 200, 201A, 203A. Individually supervised professional practice: preparation and implementation of comprehensive urban, regional or special purpose plans; study of interrelationships and roles of government, public agencies and private enterprise. Approved for *SP* grading. (Former U R P 280T)

281T. Seminar in Planning Practice (1; max total 3). Prerequisite: concurrent enrollment in C R P 280T, permission of instructor. Seminar to explore characteristics and problems of professional planning practice; written evaluations of work experience. (Former U R P 281T)

282T. Field Study of Selected Planning Topics (1–6; max total 12 if no topic repeated). Prerequisite: permission of instructor. Field study of urban and regional phenomena in relation to urbanization, urban systems, housing, and resource development. (Former U R P 282T)

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading. (Former U R P 290)

291. Directed Readings in Urban and Regional Planning (1–3; max total 6). Supervised independent reading in a selected topic related to urban and regional planning. Approved for *SP* grading. (Former U R P 291)

299. Thesis (2–6; max total 6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *SP* grading. (Former U R P 299)

Psychology

School of Natural Sciences
Department of Psychology
Terry G. Newell, Chair
Ed/Psych Building, Room 234
(209) 278-2691

B.A. in Psychology
Minor in Psychology
M.A. in Psychology
M.S. in Psychology
Services Credentials in:
Pupil Personnel
School Psychologist
Education requirements for:
Marriage, Family and Child Counselor



Psychology is concerned with the scientific study of human behavior and consciousness and the applications of these findings to the areas of home, school work and social relations. It covers topics such as learning, cognition, motivation, personality, psychophysiology, sexuality, group processes, cultural factors and abnormal behavior. Psychology is an area for students interested in learning about the behavior of humans and other organisms.

The Department of Psychology provides a variety of opportunities for students. We have an undergraduate major that can be tailored as a strong liberal education, a pre-professional degree or as preparation for graduate study in psychology. In addition, we have two advanced degrees providing professional training in psychology. Our program gives considerable emphasis to psychology as an empirical science, including research design, data analysis and interpretation, and computer skills.

Our undergraduate major is one of the strongest and most respected in the State University System as a preparation for graduate work in psychology. Our better students do well in the Ph.D. programs into which they are often accepted. As a liberal arts major, our undergraduate program provides a solid background for students choosing to enter business or other more specialized vocations immediately after graduation.

Faculty and Facilities

All full-time and some part-time members of the department hold Ph.D. degrees in psychology and many are licensed as psychologists for private practice by the State of California. Our faculty represents a wide range of theoretical orientations and interests that include most of the major areas in American psychology.

The department has an animal laboratory to service the needs of students and faculty interested in studying animal behavior. A comprehensive test library is maintained for programs in the testing and clinical areas. Complete video facilities are available for presenting training materials, research and instruction. A large number of university computer terminals are located in the department area and the department has several microcomputers of its own for instruction and research. A computerized Bio-lab is also available for training and research in biofeedback and psychophysiological studies. The department employs technicians who construct specialized equipment for research and teaching purposes.

Career Opportunities

In addition to learning theoretical views and research methods, students often have the opportunity to apply psychological principles of counseling and testing in community settings. Many students who earn the M.A. or M.S. degree obtain certification as school psychologists or school counselors. Their coursework can also meet the educational requirements for the Marriage, Family and Child Counseling license. There are openings in mental health, the public school and other agencies for these advanced students.

Current surveys show that about one-third of psychology graduates become employed in business and related vocations, one-third in education, and one-third in clinical and counseling vocations.

The B.A. degree does not train a person to work as a professional psychologist. However, a number of jobs related to psychology can be entered without advanced education. Some examples are employment interviewers, personnel managers, market researchers, management trainees, probation officers and mental health workers.

Our 30 unit M.A. degree provides a strong background for further graduate study toward the doctoral (Ph.D.) degree. In the 60 unit M.S. degree, students learn many clinical skills (psychotherapy, psychological assessment, etc.) that lead to employment possibilities in the schools and mental health settings. The M.S. degree is also a strong preparation for further graduate study.

Professional psychologists are employed in colleges and universities as instructors, researchers and counselors. State and federal governments utilize psychologists in a variety of agencies and settings (mental hospitals, rehabilitation centers, prisons, employment testing and personnel work). Finally, some psychologists are in private practice as counselors and psychotherapists, or consulting psychologists.

Faculty

Terry G. Newell, *Chair*

Barbara H. Basden
David R. Basden
Raul Betancourt
Thomas E. Breen
Alan D. Button
Karen T. Carey
William C. Coe
Arnold M. Cooper
Jennifer L. Dyck
Pattey L. Fong
Samuel S. Franklin
Alex Gonzalez
George S. Leavitt
Robert V. Levine
Harrison E. Madden
Ernst Moerk
Frank V. Powell
James Mitchell Smith
Michael J. Thackrey
Merry West

Undergraduate Adviser: Samuel S. Franklin
Graduate Adviser: Merry West

Bachelor of Arts Degree Requirements

Psychology Major

IMPORTANT NOTE: At the time the *1990–91 CSUF General Catalog* was published, revisions to the undergraduate major in psychology were being considered. Students beginning the major in Fall 1990 should consult with the department to obtain information about any possible changes which could affect them.

	Units
1. Psychology Major requirements	48
a. Applications Area (select 3): Psych 160T, 166, 169, 175, 176, 177	(9–11)
b. Basic Content Area (select 2): Psych 134, 154, 155	(7–8)
c. Basic Processes Area (select 2): Psych 121, 122, 124, 125, 126, 127	(6–8)
d. Assessment Area (all 4): Psych 42, 144, 145, 149	(16)
e. History and Systems: Psych 112	(4)
f. Psychology electives:	(1–7)
2. General Education requirements	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a dual major or minor	25–34*
Total	124

* This figure takes into consideration that one General Education CORE and a maximum of two BREADTH courses also may be applied to satisfy Psychology major requirements (see *General Education*). Courses may be selected from Psych 10, 36, 42 (CORE), 61, 132, 171. Consult the psychology department chair or department advising office for additional details.

Notes:

1. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy psychology major requirements.
2. *CR/NC* grading is not permitted in the psychology major.
3. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.

Courses Suggested for Particular Areas of Interest

1. Child Development
   - A. Applications: Psych 166, 175, 177
   - B. Basic Content: Psych 134 or 155, one other
   - C. Basic Processes: any except Psych 127
   - F. Electives: Psych 132, 167 or 168, 174; CLS 154 or 156
2. Counseling
   - A. Applications: Psych 166 or 160T, 177
   - B. Basic Content: Psych 154, one other
   - C. Basic Processes: Psych 121, 122
   - F. Electives: Psych 132, 174, 175; CLS 180T (Chicano Psychology) or CLS 156
3. Business
   - A. Applications: Psych 176, 177
   - B. Basic Content: Psych 134, 154
   - C. Basic Processes: Psych 121, 122
   - F. Electives: Psych 166 or 171, 174 or 175
4. Preparation for Graduate Work
   - A. Applications: Psych 166, or others of interest
   - B. Basic Content: Psych 154, 155, 178 (any two)
   - C. Basic Processes: Psych 121, 122
   - F. Electives: Psych 143, one course from Areas *B* or *C*

Preprofessional Preparation

A psychology major is often used as preparation for other professions. For preprofessional programs in law, dentistry, medicine and the ministry, see the *Preprofessional Preparation* section and consult an adviser in the psychology department.

Credential Programs

The Department of Psychology offers the Pupil Personnel Services Credential and the School Psychology Credential. The Pupil Personnel Services Credential must be completed prior to entrance into the School Psychology program. The admission dates for these programs are November 30 and April 30. (See psychology department for specific course requirements.)

Application forms and advising are available in the psychology department.

Psychology Minor

A psychology minor must have prior approval of the psychology department. The minor consists of 22 units of psychology courses, 15 of which must be upper division. The specific courses may be selected to satisfy the needs of individual students but must be worked out in advance with an adviser from the department and be approved by the department.

Graduate Programs

The Master of Arts and Master of Science degrees in Psychology are designed to provide students with a broad background in psychology while allowing them opportunities to pursue areas of special interest. Fulfillment of the requirements for either master's degree prepares the student for positions in related community service, public institutions, college teaching, research or entrance into Ph.D. programs in Psychology. Completion of the appropriate courses leading to the M.S. degree in Psychology may fulfill the educational requirements for the California State license in marriage, family and child counseling.

The Master of Arts and Master of Science degree programs in Psychology are based upon the satisfactory completion of the core courses required for the CSU, Fresno undergraduate major in psychology, or their equivalent. Classified standing requires an undergraduate average of *B* or better in psychology courses

and a total GRE. Aptitude Test score of 1000 (*V* plus *Q*) or a total score on the GRE. Advanced Test in Psychology equivalent to the 60th percentile (ETS norms).

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements, and Criteria for Thesis and Project.*)

Under the direction of a graduate adviser, a coherent program is prepared and submitted, directed toward the achievement of the student's goal in graduate study.

Core Course Requirements for the Master of Arts and Master of Science Degrees

	Units
1. Psych 244*	4
2. Psych 200T or 250T or 255T (one course)	3–4
3. Psych 220T or 225T (one course)	3–4
4. Psych 231*	2
5. Psych 299 (Thesis)	3–6
Total	15–20

Master of Arts Degree Requirements

The Master of Arts degree program in Psychology may be arranged to include interest areas such as general experimental, developmental, and social psychology, as well as special Master of Arts programs for individuals. This 30-unit degree program is intended primarily to prepare graduates for entry into doctoral programs in general experimental, developmental, social or clinical psychology, and may serve as preparation for community college teaching or professional employment requiring a master's degree.

	Units
Core Requirements (above)	15–20
Electives in psychology or related fields	10–15
Total	30

See the department for other recommendations related to the general experimental, developmental and social program interest areas.

Master of Science Degree Requirements

The Master of Science degree in Psychology is a 60-unit degree which can be a terminal degree or qualify one for entry into a doctoral program. This clinical program can be coordinated with developmental psychology or school psychology pursuits. Nearly half the units are field work practicum and intern work. The second year is partially spent in intern placements.

	Units
Core Requirements (above)	15–20
Courses in core program and field work (see Specific Requirements)	35–36
Electives in psychology or related fields, 200-series	4–10
Total	60

Specific Requirements: Psych 267 (12 units), 280 (4 units), 281 (4 units), 282 (4 units), 283T (3–4 units), 284 (4 units), 285 or 286 (4 units).

Specific requirements for advancement to candidacy for either degree include a score above the 60th percentile (ETS norms) on the GRE Advanced Test in Psychology. See the department for details about other requirements.

* Grades of A or B must be earned in Psych 231 and Psych 244 for graduation credit in these courses.

COURSES

Psychology (Psych)

Note: All psychology courses are open to majors and non-majors.

10. Introduction to Psychology (4). Not open to students with more than six units in psychology. Introduction to psychology as an empirical science; biological and social bases of behavior; scientific principles of psychology in perception, learning, motivation, intelligence and personality. General Education BREADTH, Division 3. (3 lecture, 2 lab hours) (CAN PSY 2)

36. Introduction to Psychophysiology (3). Functioning of the brain in learning, memory, language, motivation and emotion; human physiological correlates of emotional states, pain, dreaming; control of brain waves and internal states, lateralization of brain functions. General Education BREADTH, Division 3.

42. Introductory Statistics (4). Recommended: ELM Exam, two years high school algebra. Basic statistical methods for analysis of data; parametric tests of significance; linear regression and correlation; analysis of variance; introduction to non-parametric techniques. General Education CORE, Quantitative Reasoning. (May include lab hours) (Former Psych 142)

60T. Psychology as a Behavioral Science (1–5; max total 6 if no topic repeated). Problems in approaching man as a social animal; sections in basic or applied processes in personality, interpersonal relations, social environment and group participation. (Some sections may have lab hours)

61. Personal Adjustment (3). Not open to students with credit in Psych 171. General adjustment behavior with regard to personal, academic, social and mental health problems; application of principles of prevention of emotional problems. General Education BREADTH, Division 4.

101. Child Psychology (3). Not open to students with credit in Psych 155. The dynamics of infant and child development and adjustment.

102. Adolescent Psychology (3). Adjustment of youth to self and society. General Education CAPSTONE Cluster.

103. Maturity and Old Age (3). (Same as Geron 103.) Psychological study of maturity and old age; physiological and sociological considerations.

112. History and Systems (4). Prerequisite: 12 units in psychology. Historical, philosophical and scientific background of psychology; current systems and theoretical issues.

120T. Topics in General Psychology (2–5; max total 12 if no topic repeated). Empirical evidence and theoretical issues in learning, motivation, cognition, language, perception, sensory and physiological processes. Sections may be limited to animal or human studies; research and reporting. (Usual sections include lab hours)

121. Learning and Memory (4). Prerequisite: Psych 42. Combined survey of (1) principles from the human and animal laboratory with theoretical interpretations and applications; and (2) principles of operation of the human memory system with theoretical interpretations. (May include lab hours)

122. Motivation (4). Prerequisite: Psych 42. Initiation and continuation of behavior, acquisition and modification of motives. (May include lab hours)

124. Sensation and Perception (4). Study of sensory and perceptual processes in vision, touch, and hearing. Emphasis is placed on how basic perceptual principles operate in everyday life as well as in lab settings.

125. Physiological Psychology (4). Prerequisite: Psych 42 or permission of instructor. (Psych 36 recommended) Nervous systems structures and physiological processes underlying behavior; anatomical and physiological bases of learning, motivation, emotions, and emotional disorders. (May include lab hours)

126. Psycholinguistics (4). An introduction to theory and research in psycholinguistics: language as related to thought and culture; language acquisition; recognition, production, and comprehension of language; psychological applicability of modern linguistic theory; language as related to social processes.

127. Animal Behavior (4). Causal factors for instigation, acquisition, and maintenance of behavior in animals. Genetic, ethological, ecological, and physiological approaches are considered. (May include lab hours and field trips)

128. Cognitive Psychology (3). Prerequisite: Psych 42. An introduction to theory and research in human information processing. Topics include attention, mental representation, imagery, problem solving, reasoning, language and other higher mental processes. (Former Psych 120T section)

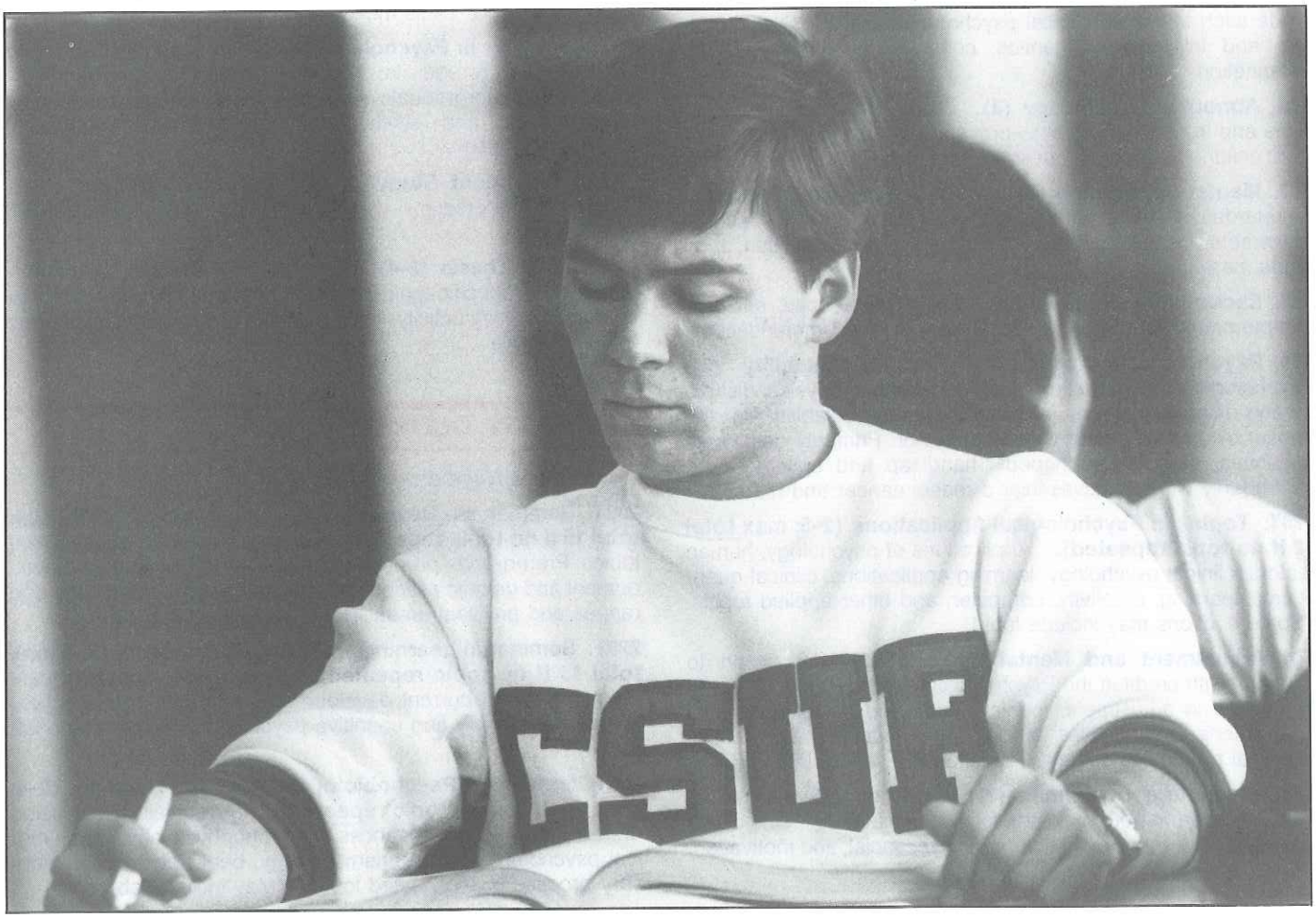
132. Psychology of Sexuality (3). Prerequisite: upper-division standing. Psychological aspects of human sexual behavior: influence on personality, various behavioral manifestations and pathologies. General Education BREADTH, Division 4.

134. Social Psychology (3). Not open to students with credit in Psych 156. Introduction to human interaction in different social environments. Major concepts, theories, and principles of social psychology, relevant findings and their applications to everyday life.

136. Human Learning and Behavior (3). Not open to students with credit in Psych 121. Open to majors and non-majors. Introduction to learning principles as they interact with perception, cognition and motivation. Relevance of these principles in understanding human adaptation to school, home and social environments. General Education CAPSTONE Cluster, Critical Thinking.

143. Intermediate Statistics (4). Prerequisite: Psych 42. Intensive study of analysis of variance with research emphasis. Topics include single and multifactor designs both with and without repeated measures, planned and post hoc comparisons, trend analysis, analysis of covariance and introduction to university computational facilities. (May include lab hours)

144. Research Designs and Experimental Methods (4). Prerequisite: Psych 42. Basic course in experimental psychology: research design statistics; introduction to scientific procedures and methods in psychology; participation in research and report writing. (May include lab hours)



145. Computer Applications (4). Prerequisite: Psych 42 (may be taken concurrently); IS 50 recommended. A comprehensive survey of computer applications in the behavioral sciences. Major emphases will be placed on theoretical and practical applications (simulations, artificial intelligence, computer control and processing), SPSS and BMD statistical packages, and other specialized computer program for psychology. (3 lecture, 3 lab hours)

149. Psychological Testing (4). Prerequisite: Psych 42. Theories of psychological testing stressing the logic and limits of measurement. Emphasis on technical and individual tests. (3 lecture, 3 lab hours)

150T. Problems in Personality, Developmental and Social Psychology (2–5; max total 12 if no topic repeated). Wholistic levels of analysis in psychology such as personality, social, individual differences, and developmental; conceptual and empirical issues. (Some sections include lab hours)

154. Personality (4). Major contemporary theories of personality; techniques for research in personality. (May include lab hours)

155. Developmental Psychology (4). Empirical and theoretical treatment of human development throughout the life span; genetic, physiological and socio-cultural influences upon development; physical, emotional, motivational, intellectual-cognitive and social facets of development. (May include lab hours)

160T. Topics in Clinical Processes (2–5; max total 12 if no topic repeated). Prerequisite: permission of instructor. Examination of individual behavior and small-group processes; include such topics as clinical psychopathology, sensitivity training, and intragroup dynamics, consciousness, dreams and imagination.

166. Abnormal Psychology (3). Study of the origins, symptoms and treatments of behavioral and personality disturbances from childhood through senescence; application of current DSM.

167. Mental Retardation (3). Psychological aspects of mental retardation; parent-child problems, etiology, nosology, school placement, institutionalization, treatment, and recognition of all types; parent and child counseling.

168. Exceptional Children (3). The atypical child; etiology, symptomatology, nosology, recognition, and recommendations.

169. Psychological Aspects of Physical Disability (3). Psychological theory and research pertaining to physical disability and disabled persons. Attitudes regarding disability and the impact of disability on individual behavior. Primarily deals with blindness, deafness, orthopedic handicap and epilepsy, and secondarily with cardiovascular disease, cancer and diabetes.

170T. Topics in Psychological Applications (2–5; max total 12 if no topic repeated). Applications of psychology; human factors; clinical psychology, learning applications, clinical quantitative, learning, creativity, computer, and other applied topics. (Some sections may include labs)

171. Adjustment and Mental Hygiene (3). Not open to students with credit in the Psych 60T section or Psych 61. Basic processes in adjustment; mental health and social problems; applications of principles of emotional health, prevention of personal problems. General Education BREADTH, Division 4.

172. Psychology of Women (3). (Same as WS 172.) Prerequisite: permission of instructor. Examination of sex differences and sex roles; biological, cognitive, social, and motivation.

173. Environmental Psychology (3–4). Man-environmental relations, psychological and behavioral effects of various ecological conditions including crowding, housing, urbanization, and space.

174. Introduction to Counseling (3). (See A S 174.)

175. Family Counseling (3). Theory and application of major counseling models. Family problems, relationships and systems. Application of child development principles, relevant communication theory and current research to therapy with couples, families, children and groups.

176. Industrial Psychology (3). Occupational assessment, training procedures, production efficiency, morale determinants, human engineering, decision processes, organization theory.

177. Behavioral and Cognitive Change Techniques (4). Introduction to learning principles and their applications to behavioral and cognitive change. Methods and techniques used for changing self, children, adolescents, and adults. (3 lecture hours, 1 practicum hour arranged).

178. Culture, Social Class and Development (3–4). An introduction to theory and research on race, prejudice, culture, and social class, and the results of these on the intellectual and social development of the child.

179. Supervised Field Experience (4). Open only to psychology majors. Prerequisite: permission of instructor. Supervised field experience in community settings. Placements may include schools, hospitals, institutions for the aged, community service agencies, and legal settings, depending on student interests. Regular class meetings.

180T. Seminar in Psychology (1–5; max total 12 if no topic repeated). Prerequisite: 9 units in psychology, permission of instructor. Undergraduate seminar in specialized areas, new developments and synthesis of psychological processes, thought, and theory.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

199. Senior Thesis (2–4). Concentrated empirical or theoretical study of specific topic in psychology; emphasis on independent and creative activity. Copy of thesis required for psychology department file.

GRADUATE COURSES

(See *Course Numbering System*.)

200T. Seminar in Developmental Psychology (2–4; max total 15 if no topic repeated). May be repeated with different topics. Prerequisite: permission of instructor. Seminars in development and genetic psychology, special topics for particular age ranges and problem areas. (May include lab hours)

220T. Seminar in Learning and Related Problems (2–4; max total 15 if no topic repeated). Prerequisite: undergraduate core. Advanced current developments in learning, perception, language, memory and cognitive psychology. (May include lab hours)

225T. Seminar in Psychobiological Bases of Behavior (2–4; max total 15 if no topic repeated). Prerequisite: permission of instructor. Recent advances in psychophysiology, physiological psychology, psychopharmacology, behavior genetics, sensory processes and related topics. (May include lab hours)

231. Ethics in Psychology (2). (Same as A Eth 200.) Prerequisite: permission of instructor. Study of ethical issues, values and problems in psychological research and practice. Topics include subject risk, confidentiality, court decisions and licensing laws. Seminar format with student presentations.

240T. Seminar in Quantitative Methods for Behavioral Research (2–4; max total 15 if no topic repeated). Prerequisite: Psych 143. Methods for analysis of multivariate data; factor analysis; multiple regression; advanced analysis of variance procedures. Computer applications and use of computers for analysis of data. (May include lab hours)

244. Seminar in Research Methods and Theoretical Issues (4). Prerequisite: Psych 143 or permission of instructor. Examination of recent theories, advanced research methods and statistical techniques in behavioral research. (May include lab hours)

250T. Seminar in Personality and Related Areas (2–4; max total 12 if no topic repeated). Prerequisite: undergraduate core in psychology. In-depth examination of the recent developments in personality and clinical psychology. (May include lab hours)

255T. Seminar in Social Psychology and Related Areas (2–4; max total 15 if no topic repeated). Prerequisite: permission of instructor. Theories and research about individual functioning in society; also includes such topics as environment psychology and the psychology of women. (May include lab hours)

267. Field Work in Clinical Methods (3–18; max total 18). Prerequisite: Psych 281, 282, 284; 285 or 286, and permission of instructor. Supervised field work in clinical assessment, intervention and case study techniques. Field placements will include hospitals, schools and clinics, depending on student's needs. Regular conferences and critiques with supervising faculty.

270T. Seminar in Applied Behavioral Science (1–6; max total 15 if no topic repeated). Prerequisite: permission of instructor. Topics in applied behavioral research; conflict management, group dynamics, organization development, sensitivity training, and related processes. For students in the fields of business, communications, education, psychology, and the social sciences. (May include lab hours)

272. Seminar in Lab Teaching (1; max total 4). Enrollment restricted to and required of graduate students teaching discussion sections in psychology laboratories. Class discussion of teaching techniques and procedures used to demonstrate principles in introductory psychology. Course may be repeated for a maximum of 4 units credit. (Former Psych 270T section)

275T. Seminar in Community Psychology and Related Areas (2–4; max total 15 if no topic repeated). Prerequisite: permission of instructor and graduate standing. May be repeated with different topics. Survey course of basic concepts in Community Psychology including levels of prevention, crisis work, consultation, program evaluation, community influence and organization and new approaches to mental health problems. Open to graduate level psychology and non-psychology majors with an interest in mental health programs.

277A. Seminar in School Psychology (2). Prerequisite: graduate standing. State education codes and court decisions related to school psychology; community resources; and observation of special educational programs.

277B. Seminar in School Psychology (2). Prerequisite: admission to the School Psychologist credential program, Psych 277A, Psych 284 and Psych 285 (may be taken concurrently). Professional issues, ethics and current practices; in-service training theory and practicum; consultation skills and individualized educational planning.

280. Seminar in Clinical Psychology (4). Prerequisite: a course in Abnormal or Clinical Psychology and permission of instructor. Historical backgrounds and current issues and developments in: training and professional preparation; issues of scientific and professional concerns in clinical assessment and intervention; psychotherapies; clinical research; other relevant topics.

281. Interviewing and Individual Psychotherapy (4). Prerequisite: a course in Abnormal or Clinical Psychology and permission of instructor. Basic interviewing skills including intake and interviews for diagnostic and therapeutic purposes. Review of current models and theories of psychotherapy. Development of applications using video taping and supervised practicums.

282. Cognitive and Behavior Therapy (4). Prerequisite: a course in Learning or Behavior Modification and permission of instructor. Historical and current trends, research issues and designs. Application of the behavior approach in a variety of settings. Includes supervised practicum experience.

283T. Topics in Clinical Intervention (3–4; max total 12 if no topic repeated). Prerequisite: permission of instructor. Advanced study in specialized areas in psychotherapy. May include topics such as clinical hypnosis, health psychology, family therapy, group therapy, etc. Practicum training usually included. Topics may not be repeated.

284. Assessment of Intellectual Abilities (4). Prerequisites: a course in Psychological Testing and permission of instructor. Review of theories of intelligence. Administration, scoring, and interpretation of individual and group measures of intelligence and creativity for children and adults. Supervised practicum includes case studies of learning problems and the role of intelligence measures in assessment batteries.

285. Assessment of Learning and Developmental Problems (4). Prerequisite: Psych 284. Administration, scoring and interpreting measures of learning disorders, physical-motor development, psychomotor abilities, social maturity, tests, school achievement, and vocational selection. Supervised practicum emphasizing proscriptive and rehabilitative recommendations in case studies.

286. Assessment of Personality and Neuropsychological Functioning (4). Prerequisite: Psych 284. Review of personality theory and psychophysiology. Administration, scoring, and interpreting measures of child and adult group, and individual objective personality tests, children's scales, neuropsychological tests and batteries. Supervised practicum.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

299. Thesis (3–6; max total 6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion, and submission of an acceptable thesis for the master's degree in compliance with Psychology Department regulations. Approved for *SP* grading.

Recreation Administration

School of Health and Social Work
Recreation Administration Program
Michael B. Hoffman, Coordinator
San Ramon 2, Room 23
(209) 278-2367

B.S. in Recreation Administration
Options:
- **Commercial Recreation**
- **General (Public-Private) Recreation**
- **Therapeutic Recreation**

Minor in Recreation Administration



The program offers a Bachelor of Science degree with a major in recreation administration for individuals who are committed to the recreation and leisure services profession. While the General Education program provides students with a foundation in the liberal arts and sciences, the major in recreation administration allows students to acquire knowledge, understanding, ability and skill necessary to successfully function in professional positions related to the major.

The faculty is committed to providing a quality professional preparation program in recreation and leisure services, founded on a competency based curriculum. Our graduates acquire specific competencies as identified by practitioners, faculty, and the National Recreation and Park Association. These competencies are related to leadership, program planning, recreation and leisure oriented activities, budgeting, evaluation of programs and personnel, history, professional ethics, philosophy, research techniques, public relations, communication skills, organizational systems, laws and legislation, facility design, administration and therapeutic techniques.

The program is accredited by the Council on Accreditation of the National Recreation and Park Association. The program offers a B.S. degree and a minor in recreation administration. Preparation is provided within the major for three distinct degree options: commercial recreation, general (public-private) recreation, and therapeutic recreation.

Within the public and private recreation option, students develop specific competencies related to the subject matter of courses in camp management, special populations, design and operation of recreation facilities, outdoor recreation, and volunteer management. Commercial recreation option students develop specific competencies in the areas of accounting, finance, business management, marketing and decision sciences. Students in the therapeutic recreation option acquire specific competencies related to the subject matter of courses in physiology, foundations of therapeutic recreation service, methods in therapeutic recreation, abnormal psychology, and individual and small group counseling.

Students in the recreation administration major complete a core of courses. These courses are designed to assist students in acquiring competencies related to the content of courses in principles of recreation, leadership and group dynamics, legal and financial aspects of recreation service, community recreation, program planning, organization and administration of leisure services, and trends, current research and professionalism.

Under the guidance of a practitioner, students in Recreation Administration earn more than 1,000 hours of paid or voluntary hands-on experience in a variety of recreation, clinical or leisure services agencies. In addition, they serve full-time internships with private or commercial recreation enterprises, public recreation agencies, non-profit organizations, park oriented agencies, clinical organizations and others.

Career Opportunities

The recreation and leisure business comprises the second largest industry in the United States. Fresno graduates who are highly motivated, assertive, and have designed their academic and work experience to meet the needs of the marketplace have been very successful in securing professional positions.

The undergraduate curriculum is designed to prepare students for possible careers as: hospital recreation therapists; nursing home activity coordinators; recreation therapists in centers for the disabled; recreation directors in detention centers; city recreation leader, supervisor, general supervisor, or specialty supervisor; city and county recreation and park manager; state recreation specialist; state recreation consultant; manager or assistant manager of a resort area; manager or assistant manager of a membership club (racket, swim, golf or fitness); hotel social director; church recreation or youth director; industrial recreation director; school recreation director; program or field director in youth agencies; camp director or assistant director; armed forces recreation specialist; and others.

Faculty

Michael B. Hoffman, *Coordinator*

Audrey M. Fagnani
Andrew E. Hoff

Bachelor of Science Degree Requirements
Recreation Administration Major

Units

Major requirements 58–63

The following courses are required of all candidates for this degree. Additional required courses dependent upon the selected option are outlined following the core program requirements.

Core Program

Rec 55, 73, 73L, 151, 168, 179, 180 ..... (18)

General Option (Public-Private) ..... (40)

Rec 95, 160, 173, 173L, 185, 186, 188 ..... (22)

Recreation electives. Elect from: Rec 80, 159, 169, 170 ..... (6)

Select 12 units from: Acct 3; Art 60, 70; B A 18; Crim 120, 133; Drama 136, 137, 138A–B; H S 48; I T 60, 162; HRM 150; Jour 113; Mgt 104; Music 9, 36–136, 39–139; IS 105W; P E 108, 152, PE AC 11, 12; OH 1, 2, 3; Pl Si 181; Psych 101; Rec 80, 101, 159, 169, 170; T Ed 135; Spch 167 ..... (12)

Commercial Option ..... (45)

Rec 95, 169, 170, 173, 173L, 188 ..... (25)

Recreation electives. Elect from: Rec 80, 159, 160 ..... (6)

Select 14 units from: Acct 3; Art 30, 40, 60, 70, 80; B A 18, 189T; CSH 110; Drama 136, 137; Engl 160W; Fin 143, 146; FScN 50, 155, 156; H S 48; HRM 150; IS 50, 105W; Jour 106, 113; Mgt 104, 106, 110, 127, 128; Music 9; OH 2; P E 105, 108, 114; Pl Si 181; Rec 80, 101; Soc 130W ..... (14)

Students in the Commercial Option are advised to complete the general business minor. Business courses taken in the minor cannot be counted in the major option. See a recreation administration faculty adviser for suggested courses.

Therapeutic Option ..... (42)

P E 105 ..... (3)
Rec 165, 166, 166L, 174, 187 ..... (24)
Psych 166 ..... (3)

Recreation electives. Elect from: Rec 80, 159, 160 ..... (3)

Select 9 units from: Art 20, 30, 40, 60, 70; A S 170; Crim 120; CSH 117; Drama 136, 137; H S 110, 48, 115; IS 105W; Music 9; P E 146; PE AC 101, 11, 12; Psych 101, 102, 103, 167, 169; Rec 80, 101, 150, 159, 160; Soc 143 ..... (9)

General Education requirements 51
Electives and remaining degree requirements *15–25

Total 128

* This figure takes into consideration that General Option majors may also apply Rec 80, 101, Art 60 or 70, and Music 9 to General Education BREADTH, Divisions 4 and 5 requirements. Commercial Recreation Option majors may also apply Music 9, Rec 80, 101, Art 30, 40, 60, or 70 to General Education BREADTH, Divisions 4 and 5 requirements. Therapeutic Option majors may also apply Art 20, 30, 40, 60, or 70 to General Education BREADTH, Division 4 requirement and Music 9 in Division 5. See the recreation administration department chair or faculty adviser for details.

Notes:

1. *CR/NC* grading is not permitted in the recreation administration major with the exception of Rec 185, 186, 187, 188.
2. General Education and elective units may be used toward a minor (see departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.

The Recreation Administration Minor ..... (24–26)

The minor in recreation administration for the Bachelor of Science degree consists of 24–26 units of which 6 must be upper division and permits, with guidance, a selection of courses to satisfy special interests and needs. The recreation administration minor offers training in activities suitable for use in recreation programs of communities, schools, youth agencies and clubs.

Rec 55, 73, 73L, 168, 173 and 173L or 174 ..... (14)

Recommended electives: P E 108; Art 70; Music 9; Drama 137; Rec 80, 95, 151, 159, 160, 165, 166, 169, 170 ..... (10–12)

COURSES

Recreation (Rec)

55. Introduction to Recreation and Leisure Service (3). Philosophical, theoretical and historical basis for recreation service in contemporary American society; exploration of the various facets of recreation and leisure service including public, private, therapeutic and commercial recreation.

73. Leadership in Recreation Service (3). Prerequisite: Rec 55. Theoretical and philosophical basis for leadership. Social dynamics of leading recreative activities.

73L. Leadership in Recreation Service Laboratory (1). Concurrent with Rec 73. Practical leadership experience in supervised recreation settings.

80. Outdoor Recreation (3). History, development and trends of outdoor recreation resources, agencies and activities. Integration of the individual with the outdoor recreation experience. Overview of the implications of outdoor recreation experiences over the lifespan. General Education BREADTH, Division 4. (Students may incur minimal expenses related to field trips.)

95. Recreation Services Integrating Special Populations (3). Prerequisite: Rec 55. Introduction to the recreation and leisure needs of special populations, and in the integration process in a community recreation setting. (Field trips may be required)

101. Leisure and Human Behavior (3). Exploration of leisure as related to the individual and society. The forces and factors affecting its role on human behavior are examined within the context of current social issues. General Education BREADTH, Division 4.

150. Perceptual Motor Development (3). (See P E 150.)

151. Community Recreation (3). Prerequisite: Rec 55. Analysis of community agencies offering recreation services. Emphasis on assessing community recreation and leisure preferences. (Field trips may be required) (Former Rec 171)

159. Volunteer Coordination (3). Analysis of the role of volunteer program coordinators, basic skills of organizing and administering a volunteer program, methods of developing and channeling voluntary effort and identifying resources.

160. Camp Management (3). Prerequisite: Rec 73, 73L. Organization, supervision and management of various types of camps. (Course fee for field trips; approximately $25)

165. Foundations of Therapeutic Recreation Service (3). Prerequisite: Rec 55, P E 105. Historical review of therapeutic recreation; identification of special populations including the study of etiology, characteristics, terminology and support systems; field trips to settings serving the mentally and physically handicapped, the developmentally disabled, the aged, the convalescent and the socially deviant.

166. Methods in Therapeutic Recreation (3). Prerequisite: Rec 165. Analysis and application of therapeutic recreation techniques, adaptive games, and activities for atypical populations; appliances, testing, charting, narrative writing and leisure counseling.

166L. Methods in Therapeutic Recreation Laboratory (2). Prerequisite: Rec 165. Must be taken concurrently with Recreation 166. Practical experiences in applying therapeutic recreation principles and processes.

168. Legal and Financial Aspects of Recreation Service (3). Prerequisite: completion of core math requirement and Rec 151. Legal and financial aspects of recreation service; budget analysis, legal terminology, and their role in recreation administration. (Field trips may be required)

169. Foundations of Commercial Recreation (3). Prerequisite: Rec 55. Historical and philosophical foundations of the commercial recreation field. Identification of providers of commercial recreation goods and services. Analysis of current trends in leisure enterprises. (Field trips may be required)

170. Leisure: Prospects for Profit (3). Prerequisite: Rec 169. The establishment, financing and marketing of commercial recreation enterprises. Conceptual, theoretical and practical concepts of commercial leisure service management explored through the development of an investment memorandum. (Field trips may be required)

173. Programs of Recreation (3). Not open to students with credit in Rec 174. Prerequisite: Rec 168. Principles and procedures of planning programs for various age groups and settings. The development of a senior project is required for the lecture section.

173L. Programs of Recreation Laboratory (1). Not open to students with credit in Rec 174L. Rec 173 concurrently. Practical program experience in supervised community based recreation settings.

174. Senior Project in Therapeutic Recreation (4). Not open to students with credit in Rec 173. Prerequisite: Rec 166, 168. A culminating experience in the Therapeutic Recreation Option. Planning therapeutic programs for special populations. Practical program experiences with disability groups required. (3 lecture, 1 lab hour)

179. Organization and Administration of Leisure Services (3). Prerequisite: Rec 168 and may only be taken the semester prior to internship. Preparation for the role of administrator of recreation and leisure services; administrative practices, the provision of sites and facilities, and management of personnel.

180. Senior Seminar (2). May only be taken the semester prior to internship. Trends and issues, current research, professionalism and internship search procedures in Recreation Administration.

185. Internship in Private Recreation (12). Prerequisite: completion of all major, General Education and university graduation requirements. Directed supervisory experience with a private recreation agency. Individual development in administration, supervision, program planning, and community and public relations; supervised, directed full-time experience in the field of private recreation, reports and conferences required. (It is recommended before internship registration that a student have the equivalent of 1,000 hours of recreation related experience either paid or volunteer, in the field of recreation service.) *CR/NC* grading only.

186. Internship in Public Recreation (12). Prerequisite: completion of all major, General Education and university graduation requirements. Directed supervisory experience with a public recreation agency. Individual development in administration, supervision, program planning, community and public relations; supervised, directed full-time experience in the field of public recreation; reports and conferences required. (It is recommended before internship registration that a student have the equivalent of 1,000 hours of recreation related experience, either paid or volunteer, in the field of recreation service.) *CR/NC* grading only.

187. Internship in Therapeutic Recreation (12). Prerequisite: completion of all major, General Education and university graduation requirements. Supervised, directed full-time experience in the field of therapeutic recreation; reports and conferences required. (It is recommended before internship registration that a student have the equivalent of 1,000 hours of recreation related experience, either paid or volunteer, in the field of recreation service.) *CR/NC* grading only.

188. Internship in Commercial Recreation (12). Prerequisite: completion of all major, General Education and university graduation requirements. Students must be interning in a commercial recreation agency in order to register in Recreation 188. Supervised, directed full-time experience in the field of commercial recreation; reports and conferences required. (It is recommended before internship registration that a student have the equivalent of 1,000 hours of recreation related experience, either paid or volunteer, in the field of recreation service.) *CR/NC* grading only.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

192T. Topics in Recreation Administration (1–3). Prerequisite: permission of instructor. Investigation of selected topics related to: administration, supervision and leadership in public recreation; therapeutic recreation; camping; and workshops related to skills in leisure oriented activities.

IN-SERVICE COURSES

(See *Course Numbering System.*)

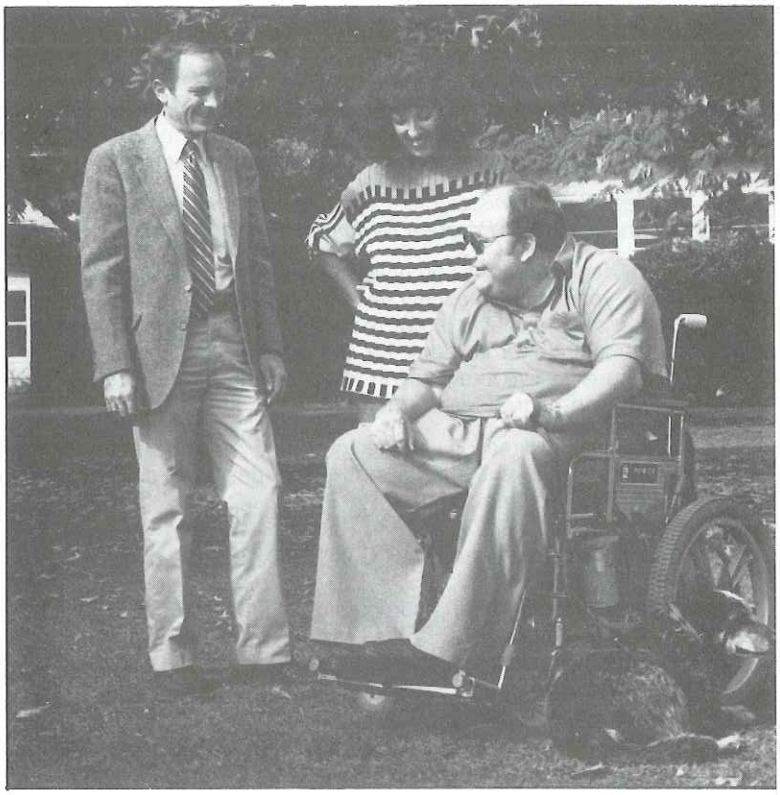
313. Recreation Activities (1–3; max total 6, may be repeated for credit). Prerequisite: permission of instructor. Open to personnel working in recreation, students and teachers. Design, application and adaptation of activities and skills to various recreational settings. May be repeated for credit.

330T. Topics in Recreation (1–3; max total 6, may be repeated for credit). Prerequisite: permission of instructor. Study and critical analysis of problems relating to organization, administration, supervision and management of agencies engaged in recreational/leisure services. May be repeated for credit provided different fields are covered.

Rehabilitation Counseling

School of Health and Social Work
Rehabilitation Counseling Program
E. W. (Bud) Stude, Coordinator
Lab School, Room 185
(209) 278-2105

M.S. in Rehabilitation Counseling



Rehabilitation Counseling is a rapidly growing profession that helps people with disabilities that result in vocational handicaps achieve more productive and useful lives. Working with those who are physically, mentally or emotionally disabled, the rehabilitation counselor helps each to appraise his or her own needs and then reach his or her optimal level of occupational, personal and social adjustment.

The graduate program in rehabilitation counseling, accredited by the Council on Rehabilitation Education, focuses on the preparation of professional rehabilitation counselors for employment in public and private non-profit or profit vocational rehabilitation programs. Emphasis is placed upon professional education for developing the skills and knowledge necessary for effective rehabilitation counseling of individuals with vocational handicaps. The variety of activities performed by rehabilitation counselors necessitates a program highly diversified in character and interdisciplinary in nature.

The objective of the graduate program in rehabilitation counseling is to prepare the student to enter a life long profession, not just a specific job or position. Consequently, the rehabilitation counseling curriculum is concerned with: teaching methods and patterns of learning, the development of professional attitudes, and a professional identification; and the adoption of a critical, questioning and exploratory attitude. The ultimate objective of graduate preparation in rehabilitation counseling is to assure that clients of public and private rehabilitation agencies receive the high quality of counseling services to which they are entitled.

Faculty and Facilities

To assure that these objectives are achieved, the program includes:

1. Faculty who have practiced as rehabilitation counselors, are identified professionally with the field of rehabilitation counseling, are Certified Rehabilitation Counselors (CRC) and hold doctoral degrees in rehabilitation counselor education;
2. A combination of practical field and classroom experiences including a full-time *Internship* during the last semester of the program which gives students an opportunity for application of theory to the practice of rehabilitation counseling in a rehabilitation setting;
3. Flexibility in curriculum design to meet the needs of students enrolled in the program;
4. The opportunity for interdisciplinary education;
5. Student eligibility to take the exam to become a Certified Rehabilitation Counselor (CRC) during the last semester; and
6. Readiness to assume a rehabilitation counseling position in a variety of work settings upon completion of degree requirements.

Career Opportunities

Rehabilitation counselors find employment in a variety of work settings including: state/federal vocational rehabilitation programs, sheltered workshops, medical rehabilitation centers, private (for profit) practice, drug and alcohol abuse rehabilitation programs, county and private mental health programs, community college and university disabled student programs, industry alcohol/industrial accident/employee assistance programs and insurance company rehabilitation programs.

At the present time, the trend in job opportunities is away from state/federal government agencies and toward private practice. This is primarily due to reduced government budgets and passage of worker's compensation laws in many states mandating rehabilitation benefits for industrially injured workers. In addition, there is a trend toward employers preferring master's degree graduates who are Certified Rehabilitation Counselors in both public and private work settings.

Follow-up studies of CSU, Fresno rehabilitation counseling program graduates indicate that 83–90 percent have found employment as rehabilitation counselors in one of the work settings listed above. The starting salary range is from $15,000 to $25,000 per year with an average starting salary of $20,000 per year.

Although the CSU, Fresno rehabilitation counseling program offers a terminal master's degree (one that prepares the student to work in the field rather than going on for an advanced degree), 16 universities throughout the United States offer doctorates in rehabilitation counseling and accept graduates from master's degree programs such as the one at CSU, Fresno.

Faculty

E. W. (Bud) Stude, *Program Coordinator and Adviser*

Master of Science Degree Requirements

The Master of Science degree in rehabilitation counseling assumes undergraduate preparation in psychology or counseling or a closely-related area. A baccalaureate degree in an unrelated area is acceptable provided that the student has a working knowledge of the behavioral sciences. A knowledge of elementary statistics is also expected. Admission to classified standing is dependent upon an evaluation of the student's background by the rehabilitation counseling faculty.

(See also *Admission to Graduate Standing, Advancement to Candidacy* and *Program Requirements.*)

The degree requires 60 units of credit and is designed to cover two years' full-time coursework, including a full semester of internship. A thesis is not required; however, the student must demonstrate proficiency by the satisfactory completion of a comprehensive examination in addition to fulfillment of all other specified degree requirements.

Under the direction of the graduate adviser, each student prepares and submits an individually-designed program within the following framework:

	Units
Required Core Courses: R C 201, 203, 211, 212, 221, 241, 251T, 296	35
Courses in supporting curriculum (at least 18 units in 200 series courses)	
Counseling Courses: A S 224, 228	
Testing Course: A S 227	
Behavioral Dynamics Courses: Psych 154 or 250T and 166	15
Electives: As approved by adviser	10
Total	60

GRADUATE COURSES

(See *Course Numbering System.*)

Rehabilitation Counseling (R C)

201. Seminar in Rehabilitation Counseling (3). Seminar in the fundamental concepts of rehabilitation counseling and vocational rehabilitation including examination and analysis of historical, philosophical, organizational and functional principles. Community rehabilitation agency or orientation visits.

203. Job Placement in the Rehabilitation Process (3). An experiential seminar concerning the attitudes, skills and abilities necessary to provide effective vocational and job placement services to the disabled, including vocational diagnosis, job development, placement techniques, job analysis, affirmative action and appropriate legislation. (2 seminar, 3 lab hours)

211. Medical Aspects of Disability (3). Seminar in the treatment of disabling conditions including etiology, functional limitations and vocational implications. Student presentation of case studies.

212. Psychological and Social Aspects of Disability (3). Seminar in psychological and sociological effects of physical and mental disability and the dynamics of adjusting to disabling conditions. Student presentation of case studies.

221. Case Practices in Rehabilitation Counseling (4). Prerequisite: R C 201, 211. Seminar in methods for facilitating client rehabilitation including: interviewing, case recording, plan development, ethical practices; field placement in a community rehabilitation agency; and student case presentations. (2 class, 6 lab hours)

241. Rehabilitation Counseling Practicum (4; max total 8). Prerequisite: R C 201, 203, 211, 212, 221, A S 224. Laboratory rehabilitation counseling experiences with clients who are disabled, supervised individual counseling sessions, analysis of the effect of disability on personal and vocational development, methods of facilitating vocational rehabilitation, observations, critiques, report writing. Students must carry professional liability insurance. (2 seminar, 4 lab hours)

251T. Selected Topics in Rehabilitation (3; max total 12). Prerequisite: R C 201, 203, 211, 212, 221. Topics seminar rotated each semester to include subjects such as principles and techniques of supervision and administration, rehabilitation program evaluation, rehabilitation research, current professional issues in rehabilitation counseling, work evaluation procedures, rehabilitation of the severely disabled and the industrially injured worker.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

296. Internship in Rehabilitation Counseling (12). Prerequisite: R C 201, 203, 211, 212, 221, 241, 251T, permission of instructor. Full-time, supervised field placement in one of a variety of settings including case responsibilities. *CR/NC* grading only.

299. Thesis (2–6; max total 6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSES

(See *Course Numbering System.*)

303. Human Interaction in Rehabilitation (1–3). An exploration of human interaction skills in the rehabilitation services. The course is designed to increase the likelihood that people who wish to improve their ability to interact with others can learn to do so. A transdisciplinary attitude is the goal.

333T. Topics in Rehabilitation (1–3; may be repeated for credit, provided different topics covererd). Selected areas in rehabilitation counseling: placement skills, vocational evaluation, research, medical history, rehabilitation case management, mental health rehabilitation and rehabilitation counseling strategies.

Requirements for majors in the various departments are listed in the respective program descriptions. For the social science major, the following requirements must be met.

Bachelor of Arts Degree Requirements

Social Science Major

The social science major consists of a minimum of 39 units of approved upper-division courses selected in such a way as to ensure a breadth of exposure to the social sciences. Students electing the major must satisfy all of the requirements listed below.

Preparatory Work. Since the major is comprised of upper-division courses, some of which, in addition, have prerequisites, the student must have some exposure to introductory work in the social sciences. And, while no specific number of units are mandated, it is assumed that such preparation will encompass more than the minimal exposure guaranteed by the General Education requirements.

Courses appropriate for this purpose include, but are not limited to: Anth 2, Econ 40, 50, Eth S 1, Geog 2, Hist 1, 2, Pl Si 1, and Soc 1.

	Units
1. Major requirements	39
Approved upper-division electives (see list below and note #2)	
2. Additional requirement	3–4
Statistics: Select from Geog 110, Math 11, Pl Si 90, Psych 42, Soc 25 or Speech 106	
3. General Education requirements	51
4. Electives and remaining degree requirements	30–34*
(See *Degree Requirements*); may include a dual major or minor	
Total	124

* This figure takes into consideration that Math 11 or Psych 42 also may be applied to fulfill the General Education CORE, Math requirement if Algebra II was completed in high school (see *General Education*). Consult the social science major adviser in the history department, for additional details.

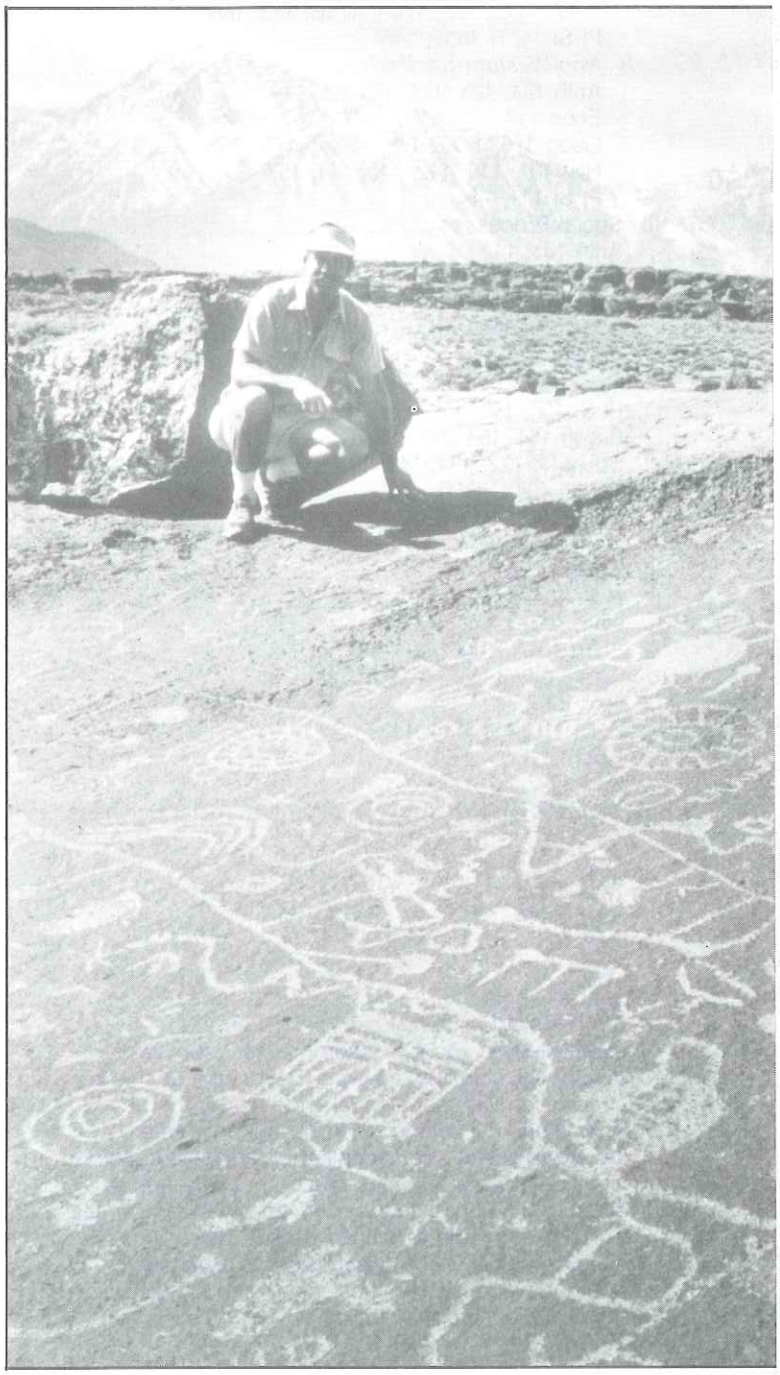
Notes:

1. *CR/NC* grading is not permitted in the social science major.
2. Social science major courses may *not* be used to fulfill General Education BREADTH or CAPSTONE requirements.
3. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor), or a secondary teaching credential (see *Single Subject Credential Program*). Consult the appropriate department chair, program coordinator or faculty adviser for further information.

Approved Upper-Division Elective Courses. In satisfying the unit requirements listed below, students shall arrange their programs to ensure completion of a minimum of 6 units in at least four but no more than six disciplines, and no more than 18 units in any one. These disciplines include anthropology, criminology, economics, ethnic studies (African-American studies, Chicano and Latin American studies, etc.), geography, history, political science, psychology, sociology, and city and regional planning.

Social Science Major

School of Social Sciences
Peter J. Klassen, Dean
Social Science Building, Room 108
(209) 278-3013



Units

I. The Record of Human Societies
- *A. Western Societies* 6
  - CLS 112, 114, 115
  - Econ 110, 111
  - Geog 161, 166T, 172, 174T
  - Hist 111, 112, 120, 121, 122, 125, 126, 130, 132, 133, 171, 172, 173, 174A, 174B, 178, 186
  - Pl Si 142T, 143T, 146T
- *B. Non-Western Societies* 6
  - Anth 121, 123, 124, 131
  - Econ 114
  - Geog 176, 177T, 179, 180, 181T
  - Hist 107, 110, 142, 143, 144, 157
  - Pl Si 141, 144T

II. Social Processes 6
- Anth 105, 142, 150W
- Crim 109, 140, 141, 153
- Econ 117, 131, 150, 161, 174, 178, 179, 180
- Ethnic Studies: Af Am 144; CLS 116, 126, 128, 152, 160; W S 152
- Geog 127, 150, 160, 162, 164, 165
- Pl Si 120, 150, 151, 170, 181
- Psych 134, 154, 166, 173
- Soc 111, 122, 131, 143, 144, 145, 151, 157, 161, 162, 163, 164, 165
- Spch 108, 160, 163
- C R P 100

III. Social Theory 6
- Anth 104
- Crim 100, 120
- Econ 100A, 100B, 101, 108
- Geog 160
- Hist 135
- Pl Si 110, 111, 114, 140
- Psych 112
- Soc 152, 153

IV. Methods and/or Techniques in the Social Sciences 3
- CLS 142
- Crim 170
- Hist 100W
- Psych 144
- Soc 175
- Spch 166

V. Special Topic 12

The special topic shall consist of a program of upper-division social science courses, approved by a social sciences adviser, which, as a unit or in conjunction with courses taken to satisfy the above requirements, explores a single topic of interest to the student. With the exception of those listed below, all upper-division courses offered in anthropology, economics, ethnic studies (African-American studies, Chicano and Latin American studies, etc.), geography, history, political science, psychology, sociology, speech communication, and city and regional planning may be employed to satisfy this requirement.

Courses that may not be applied to the social science major:

Anth 101, 161, 162, 163, 164, 169T, 181, 186, 190, 192, 199
Econ 185, 190
Ethnic Studies: As Am 150, 190; Af Am 190; CLS 100, 101, 106, 108, 190; NAS 190
Geog 100, 102, 104, 105, 106, 111, 112, 114, 117, 118, 120, 121, 190, 192
Hist 190
Pl Si 190, 191
Psych 42, 101, 102, 103, 120T, 124, 125, 132, 143, 149, 150T, 155, 160T, 167, 168, 170T, 171, 174, 175, 176, 180T, 190, 199
Soc 190
Spch 103, 114, 115, 140, 142, 165, 189, 190
C R P 190, 191

Social Science Credential Requirements

The Single Subject Waiver Program consists of the following:

I. *Core* *Units*

A. Lower-division survey courses 21
B. Upper-division work in one teaching area 18
(e.g., history, geography or political science)

II. *Breadth*

A. Lower-division survey courses 9
B. Upper-division work in a second teaching area 9
(e.g., history, geography or political science)

The 57-unit Single Subject Waiver Program may be completed while earning a bachelor's degree in any area of study. Undergraduate students beginning their waiver programs should be advised, however, that bachelor degrees in history, geography or political science are recommended for those intending to teach secondary social studies because they most closely parallel the Social Science Credential Requirements.

A detailed description of the program outlined above is available from the social science credential adviser (Dr. Jeronima Echeverria, Department of History). Credential candidates should consult the adviser as early in their programs as possible. Students should be aware that without advisement successful completion of this program is impossible.

Social Work Education

School of Health and Social Work
Department of Social Work Education
Benjamin Cuellar, Chair
San Ramon 2, Room 24
(209) 278-3992

B.A. in Social Work
M.S.W., Master of Social Work

The Bachelor of Arts degree program prepares students for beginning professional practice as well as for consideration for admission to master's degree programs. The Master of Social Work degree prepares social workers for advanced clinical social work practice and advanced generalist practice. Both the B.A. and M.S.W. graduates find employment in a host of public and private social agencies such as: public social services, mental health programs, family services, correctional programs, medical and hospital programs, child welfare services, and alcohol and drug abuse programs. Both the B.A. and M.S.W. programs are accredited by the Council on Social Work Education.

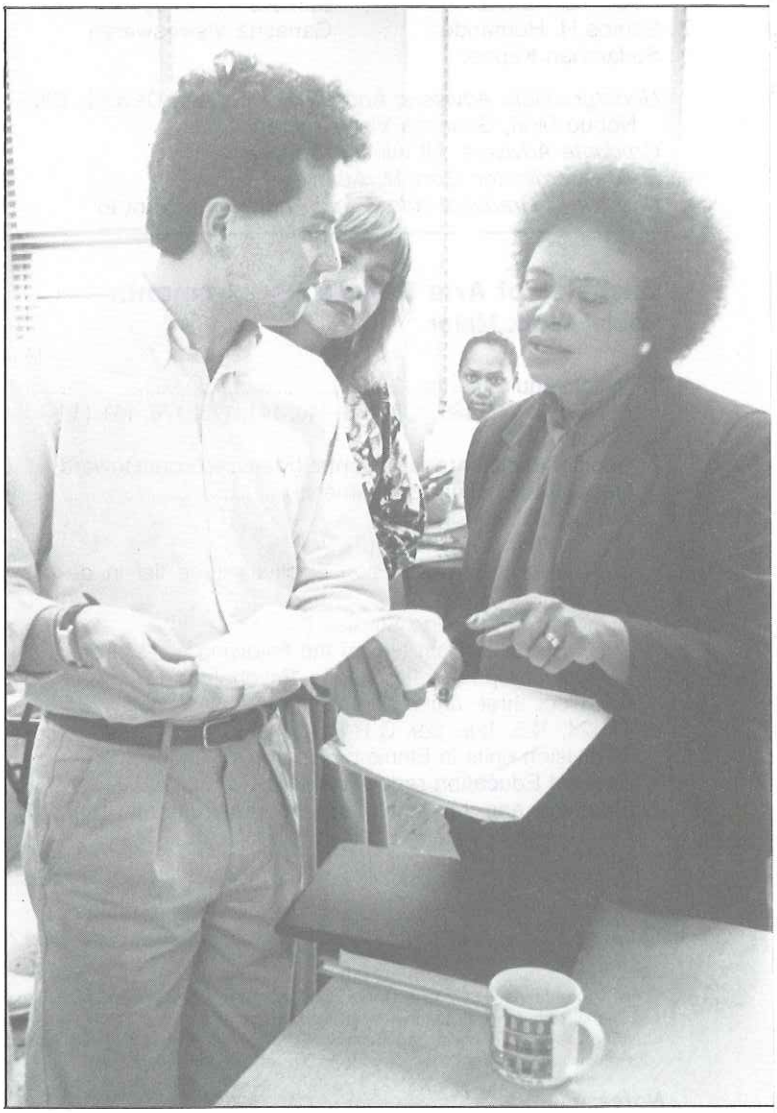
Faculty and Facilities

The faculty of the Department of Social Work Education represent a wide variety of theoretical orientations and approaches to professional practice. All have substantive practice experience and many have research interests. Several public and private social agencies in the San Joaquin Valley have made their facilities and staff available for the department's program. A representative sample of these agencies include: Atascadero State Hospital; Big Brothers/Big Sisters of Fresno; California State Department of Corrections, Human Resources Development, Social Services, Youth Authority; California State University, Fresno; Fresno Community Hospital; Fresno County: Mental Health Department, Probation Department, Department of Social Services, Valley Medical Center; Infant of Prague; Kings View Mental Health Services; Madera County Welfare Department; Marjorie Mason Center; Merced County Department of Mental Health; Merced County Welfare Department; Planned Parenthood of Fresno; Oncology Counseling Center; St. Agnes Hospital; Valley Children's Hospital; Veterans Administration Hospital; Vietnam Outreach Center; Area Agency on Aging; Gerontology programs; Rural Social Work programs; Tulare County: Executive Office, Mental Health, Welfare Department; Stanislaus County Mental Health Department; Central Valley Regional Center.

Career Opportunities

Graduates from the B.A. program typically find employment in county departments of social services; private agencies offering individual, group or community services; poverty and mental health programs; social rehabilitation; human resources development; and services to the handicapped, aged and special population groups. The M.S.W. graduates can expect to hold responsible clinical, case management and administrative positions in a broad spectrum of human service organizations.

The U.S. Department of Labor *Occupational Outlook Handbook* 1984–85 projects 20–29 percent growth in social work job opportunities through the mid-1990s. Special mention must be made regarding increased job opportunities in child welfare, mental health, substance abuse programs and services for the elderly.



Faculty

Benjamin Cuellar, *Chair*

Cora M. Adams
Andrew J. Alvarado
Clifford V. Bonham
Frederick W. Childers
David L. Ellis
Richard D. Ford
Mark G. Hanna
Robert L. Hatmaker
Santos H. Hernandez
Sudarshan Kapoor
Robert K. McMain
Nobuo Mori
Patricia R. Pickford
Erving C. Ruhl
Jon D. Shaver
Wynn C. Tabbert
Nancy J. Van Den Bergh
Barbara K. Varley
Ganesha Visweswaran

Undergraduate Advisers: Andrew J. Alvarado, David L. Ellis, Nobuo Mori, Ganesha Visweswaran
Graduate Advisers: All full-time faculty
Field Coordinator: Cora M. Adams
Director of Graduate Admission: Andrew J. Alvarado

Bachelor of Arts Degree Requirements
Social Work Major

	Units
1. Major requirements: S Wrk 20, 123, 130, 135, 136, 140, 141, 175, 176, 181 (10 units), 185	42
2. Additional major requirements: (May also count toward General Education requirements)	18
a. Econ 25, 40, or 50 (3)	
b. Biol 105, 107, or 122 (3)	
c. Approved upper-division electives (see list in department office) (9)	
1) Chicano-Latino Studies (3)	
2) Six units from two of the following three areas: Anthropology, Sociology, Psychology (6)	
d. Select three units from the following: S Wrk 122T, 124, 125, 128, 129, C R P 100, or approved upper-division units in Ethnic or Women's Studies (3)	
3. General Education requirements:	51
4. Electives and remaining degree requirements (see *Degree Requirements*); may include a dual major or minor:	*13–25
Total	124

* This figure takes into consideration that, with proper selection, 15 units of additional requirements for the social work major also may be applied toward fulfilling General Education requirements (see *General Education*). Consult the social work department chair or your faculty adviser for details.

Notes:

1. Approved course listings are available in the department office. Consult your faculty adviser for assistance in selecting a pattern of courses to fit your particular interests and goals.
2. *CR/NC* grading is not permitted in the social work major with the exception of S Wrk 181.
3. General Education, additional requirements, and elective units may be used toward a dual major or minor (see *Dual Major or departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.*
4. Senior year internships are arranged by the field coordinator. Applications must be filed, interviews with the field coordinator and agency selection interviews completed the semester *prior* to entering the field.
5. Students who have prior knowledge of Spanish but lack fluency are encouraged to take additional coursework in Spanish.
6. A booklet describing the program more fully is available in the department office.
7. Students are encouraged to take S Wrk 140 prior to S Wrk 141.

Certificate in Alcohol/Drug Studies

The Department of Social Work Education is participating in a certificate of special study awarded to those students who successfully complete a minimum of 12 units of interdisciplinary academic coursework in the area of alcohol and drug abuse. (For complete details, see *Health and Social Work, Interdisciplinary Courses,* in this catalog.)

Master of Social Work Degree Requirements

In the 60-unit program all students are required to take the following foundation courses: S Wrk 200, 203, 214, 215, 220, 240, 292A, 292B, 250 and 251, in addition to completing an individual thesis (299) or project (298), for a total of 44 to 46 units. In consultation with their faculty advisers, students also enroll in graduate social work seminars (9 units) related to their professional career goals of clinical practice, or generalist practice. In addition, students may elect to take an independent study (290), usually for 2 units, and 3–5 units of topics electives.*

* Topics electives may be selected from S Wrk 271T, 272T or from other departments, subject to approval.

COURSES

Social Work (S Wrk)

1R. College Planning Skills (2). Seminar in skills, techniques, and strategies needed in order to make a successful academic and personal adjustment to college life. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

20. Introduction to Social Work (3). Social, economic, political, historical and philosophic components in development of social welfare and social work in western society.

122T. Topics in Social Work (1–3; max total 15). Topics in fields of social work practice, basic social work theories and social work methods.

123. Seminar in Social Welfare Policies and Programs (3). Basic policies and major programs in contemporary social welfare; consumption, income supports, job provision, housing, health, civil rights, consumer advocacy, population control, environmental standards; principles of social security, administration of social services, roles of government and citizen participation.

125. Social Services for the Aging (3). (Same as Geron 125.) Students will be aquainted with the common bio-psychosocial needs of the aging in the United States and the social services available to meet those needs. Within the context of social work values and problem-solving methods, attention will be given to issues of ethnicity, gender and gaps in services. (Former S Wrk 122T section)

128. Child Welfare (3). History, development and provision of child welfare services in the United States.

129. Treatment of Chemical Dependency (3). Intervention and treatment of the chemically dependent and of family members; community resources; laboratory skills development.

130. Seminar in Social Work Processes (3). Introduction to social work intervention.

135. Human Behavior and the Social Environment (3). A general systems approach focused on the interaction of biological, psychological and cultural phenomena with individuals, small groups, complex organizations and communities.

136. Foundations for Social Work with Oppressed Groups (3). Cultural, economic, ethnic, social and psychological considerations for helping members of groups who suffer oppressed status in our heterogeneous society. (Former S Wrk 142)

140. Seminar in Micro Practice (4). Cannot be taken concurrently with S Wrk 141. Seminar emphasizing integration of human behavior and social environment theories with principles of beginning social work counseling techniques with individuals, families and small groups. (3 lecture, 2 lab hours)

141. Seminar in Macro Practice (4). Cannot be taken concurrently with S Wrk 140. Analysis of and interventive strategies in large groups, organizations and the community. (3 lecture, 2 lab hours)

175. Seminar in Human Services Research (3). Research design in human services; sampling, instruments for data collection.

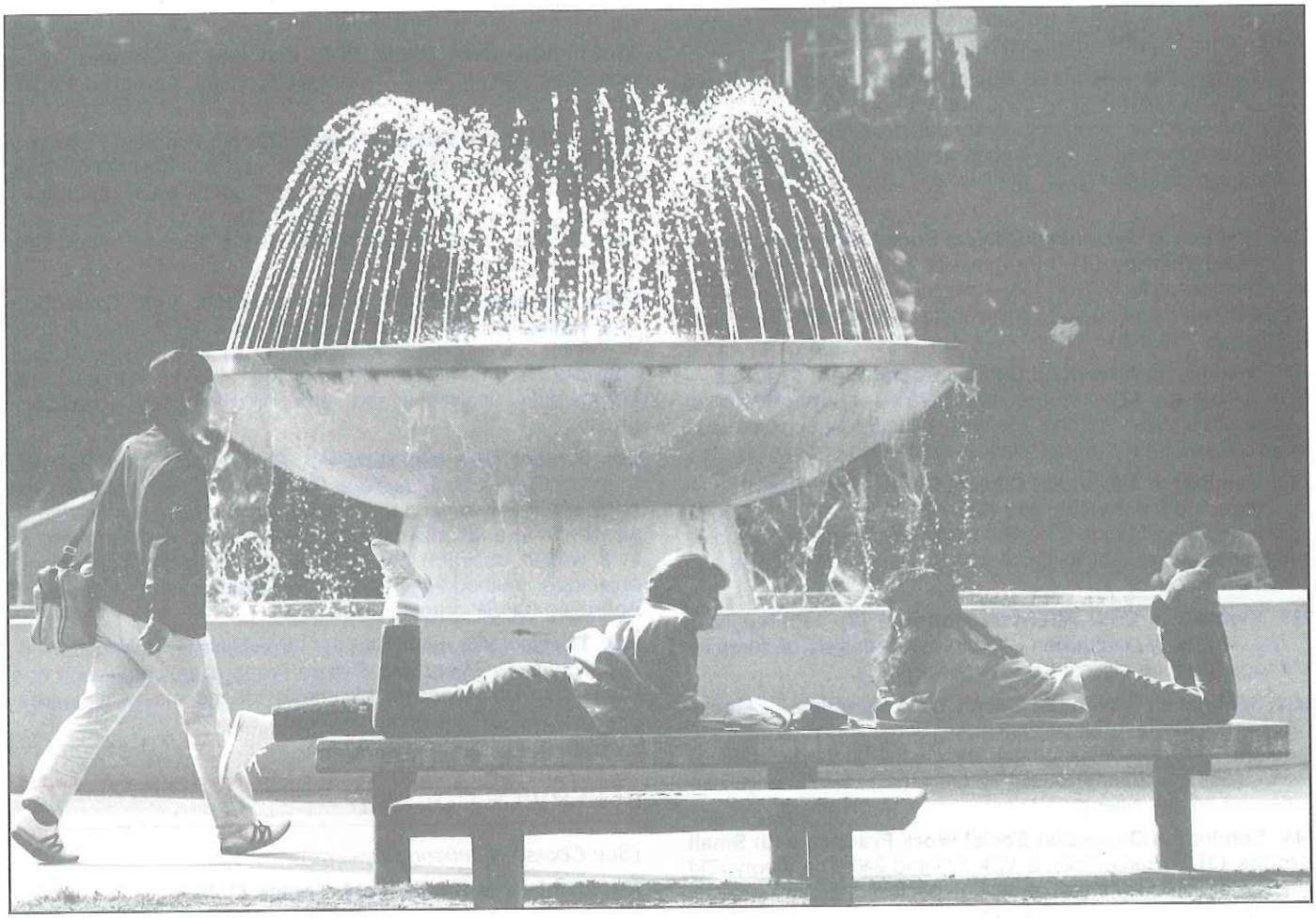
176. Seminar in Data Analysis and Presentation (3). Introduction to statistical methods and computer utilization. Application of research methods to problems of program development and evaluation with a focus on analysis and interpretation of data.

180. Training in Public Services (1–2; max total 5). Planned and supervised experience or study in a field of occupational specialization.

181. Field Instruction (5; max total 10). Open only to senior Social Work majors or by permission of instructor. Five units to be taken in conjunction with S Wrk 140; 5 units in conjunction with S Wrk 141. Guided social work practice experience with individuals, groups, families and organizations in the community.

185. Capstone Seminar (3). Open only to Social Work majors. Prerequisite: senior standing, five units of S Wrk 181. Culminating senior seminar integrating theory and practice of social work, current trends in the profession.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.



GRADUATE COURSES

Social Work (S Wrk)

Note: Admission to the M.S.W. program is prerequisite to all graduate courses. Exceptions may be authorized by the department chair.

200. Social Welfare Policy I (3). Analysis of major social welfare policies; includes consideration of legislative history, social, political and economic factors, court decisions, and administrative implementation. Comparison of various policy analysis frameworks; the legislative process and involvement of social workers therein.

203. Social Welfare Policy II (3). Prerequisite: S Wrk 200. Analysis of social agency policy. Board and administrative policy; internal and external influences on development; role of staff, particularly direct-service practitioners, in policy development and revision; impact of policy decisions on service delivery system.

214. Human Behavior and Social Environment: Individual Behavior (4). A bio-psycho-systems perspective of the transactional context for the adaptive-maladaptive continuum of individual behavior throughout the life span.

215. Human Behavior and Social Environment: Small Group, Organizational and Community Behavior (4). Theories of small groups, organizational and community behavior from a social systems perspective.

220. Seminar in Advanced Social Work Practice — Micro (3). Prerequisite: Prior or concurrent enrollment in S Wrk 214 required. Seminar about the historical development of direct social work practice with an emphasis upon brief and short-term intervention with individuals, families and small groups. (Former S Wrk 223)

224. Seminar in Advanced Clinical Social Work Practice — Individual Therapy (3). Prerequisite: S Wrk 220 and concurrent enrollment in S Wrk 250. Advanced study of theories of psychotherapy and social work practice for intensive treatment. (Former S Wrk 228)

226. Seminar in Advanced Clinical Social Work Practice — Group Therapy (3). Prerequisite: S Wrk 224 or permission of instructor. Analysis of the theories, practice, principles and techniques of clinical social work practice with small groups.

227. Seminar in Advanced Clinical Social Work Practice — Marriage and Family Therapy (3). Prerequisite: S Wrk 224 or permission of instructor. Analysis of theories, practice, principles and techniques of clinical social work practice with couples and families.

229. Seminar in CSW Alternate Methods (3). Prerequisite: S Wrk 220 or by permission of instructor. Analysis of alternate methods affecting clinical social work practice.

240. Seminar in Advanced Social Work Practice — Macro (3). Prerequisite: prior or concurrent enrollment in S Wrk 215 required. Historical development, knowledge and skills of social work practice with large social systems (e.g., formal organizations and communities).

244. Seminar in Generalist Social Work Practice with Small Groups (3). Prerequisite: S Wrk 220 and 240. The theory and practice of social work with small groups, including task groups, natural groups and treatment groups.

246. Seminar in Generalist Social Work Practice with Formal Organizations (3). Prerequisite: S Wrk 220 and 240. Theory and practice of the administration of formal social service organizations.

247. Seminar in Generalist Social Work Practice with Communities (3). Prerequisite: S Wrk 220 and 240. Theory and practice of community development, social action, social planning and program development at the community level.

250. Field Instructed Practice (2–8; max total 8). Advanced field instructed practice experience in work with individuals, groups, families, formal organizations and communities; applying the theories and concepts of social work practice. Approved for *SP* grading.

251. Field Instructed Practice (2–8; max total 8). Prerequisite: S Wrk 250. Continued advanced field instructed practice experiences in work with individuals, groups and families, formal organizations and communities, applying the theories and concepts of social work practice. Approved for *SP* grading.

271T. Seminar in Social Work Specializations (1–3; max total 8). In-depth study of specific treatment modalilties or methods, e.g., community organization, community development, crisis intervention, personality adjustment.

272T. Seminar in Areas of Social Work (1–3; max total 8). Theories and developments in the areas of mental health, public health, administration of justice, child welfare, family welfare, income maintenance, schools, international social work, social gerontology, social rehabilitation.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

292A. Advanced Social Work Research: Problem Formulation and Method (2). This course explores advanced topics in social work research including: conceptualization, operationalization, design and sampling strategies. It allows students to prepare a proposal for an independently pursued, empirically based research project.

292B. Advanced Social Work Research: Data Collection and Analysis (2). Prerequisite: S Wrk 292A. This course examines advanced strategies for social work research data collection and analysis. Students are able to independently collect data, analyze it and report findings from a research project.

298. Project (2–4; max total 4). Prerequisite: S Wrk 292A–B, See *See Criteria for Thesis and Project.* A project must evidence originality and independent thinking, appropriate form and organization, and a rationale. It must be described and summarized in a written abstract that includes the project's significance, objectives, methodology and a conclusion or recommendation. Approved for *SP* grading.

299. Thesis (3–6; max total 6). Prerequisite: S Wrk 292A–B. See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.*)

301. Seminar in Social Work Topics (1–3).

Sociology

School of Social Sciences
Department of Sociology
Elizabeth N. Nelson, Chair
Social Sciences Building, Room 227
(209) 278-2234

B.A. in Sociology
Minor in Sociology

Sociology is the study of social life and the social causes and consequences of human behavior. Sociology's subject matter ranges from the intimate family to the hostile mob, from crime to religion, from the divisions of race and social class to the shared beliefs of a common culture, from the sociology of work to the sociology of sport. In fact, few fields have such broad scope and relevance.

Training in sociology provides students with a special perspective on human development and social life which is an especially important part of a liberal education. Theory and research methods provide the foundation for study in sociology. On this foundation, different programs of electives can be built to meet the needs of students with different goals and interests.

Faculty and Facilities

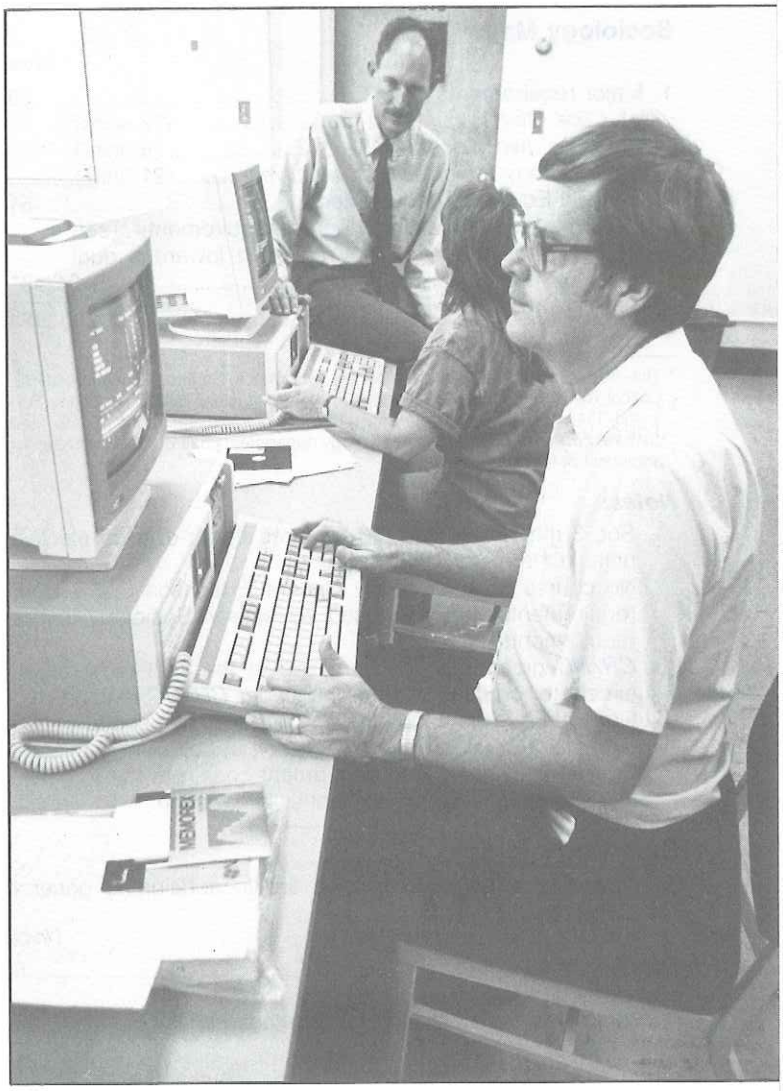
All full-time faculty hold Ph.D. degrees and share a commitment to excellence in teaching. Their areas of special interest are diverse, including social change, deviance, women in society, social stratification, social psychology, social theory, and research methods. Most of the faculty are actively involved in research and the department encourages students to gain research experience.

Some students conduct their own research projects; others assist faculty members or work with the CSU, Fresno Social Research Laboratory (SRL). Recent faculty research included studies of the history of crime, intermarriage, family power, and discrimination in contemporary courtrooms. The SRL conducts applied research on topics of local concern. Recent SRL studies examined health hazards near toxic waste dumps and population patterns in new neighborhoods. The opportunity to gain practical research experience while working closely with faculty members can add a special dimension to education in sociology at CSU, Fresno. Students can also apply their sociological training through internships with local counseling or social service agencies.

Career Opportunities

Students trained in sociology at CSU, Fresno have entered a wide variety of occupations. Although only a few students plan to become professional sociologists, training in sociology provides a solid background for a variety of careers. The research emphasis of this department provides training in data gathering, analysis, and report writing which is valuable in many careers. In addition, an understanding of the relationships between individuals and groups can prove useful in work, as well as in everyday life.

A few of our students have become professional sociologists. After completing graduate school, they became university professors. While most professional sociologists teach, an increasing number hold research positions in a variety of organizations. Many more students have found sociology to be an excellent preparation for law school. Still other CSU, Fresno graduates have taken graduate training and entered other professions, including anthropology, library science, social work, counseling, criminology, rehabilitation counseling, and public administration. Those students who begin work after completing a bachelor's degree in sociology usually enter careers in business and management, in the administration of public and private social service agencies, or as human services workers or research analysts in a variety of organizations.



Faculty

Elizabeth N. Nelson, *Chair*

Joel Best	Albert I. McLeod
Alfred J. Claassen	Edward E. Nelson
S. John Dackawich	Robert S. Palacio
Robert D. Fischer	John N. Tinker
Elizabeth Hartung	Chandler Washburne

Bachelor of Arts Degree Requirements
Sociology Major

	Units
1. Major requirements	39
a) Core: Soc 1, 25, 153, 175	(12 units)
b) Select two: Soc 151, 152, 162	(6 units)
c) Sociology upper-division electives	(21 units)
2. General Education requirement	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a dual major or minor	34–43*
Total	124

* This figure takes into consideration the fact that a General Education CORE, Critical Thinking course (Soc 3) and a maximum of two BREADTH courses (Soc 1 and 131) may be applied to satisfy the sociology major requirements (see *General Education*). Consult the sociology department chair or faculty adviser for additional details.

Notes:

1. Soc 3 may be substituted for three upper-division elective units in the major.
2. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy Sociology major requirements.
3. *CR/NC* grading is not permitted in the sociology major, except for courses offered only under *CR/NC* grading.
4. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or department minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.

Sociology Minor

The following minor requirements are in addition to general education requirements.

	Units
Soc 1, 25	6
Sociology upper-division electives (Soc 3 may be substituted for 3 of these units)	15
	21

A sociology course used to satisfy General Education CAPSTONE may be used as part of the Sociology minor.

COURSES

Sociology (Soc)

1. Principles of Sociology (3). Introduction to the principles and theoretical perspectives of sociology and their application to the fundamental problems of social life. Discussion of sociological methods and findings in such areas as: family, race relations, deviance. General Education BREADTH, Division 8. (CAN SOC 2)

2. Social Problems (3). Introduction to major sociological perspectives on social problems. Analysis of causes and possible solutions to such problems as poverty, discrimination, crime, delinquency, alcoholism, drug abuse, suicide, family disorganization, and pollution. General Education BREADTH, Division 8. (CAN SOC 4)

3. Analysis of Social Life (3). Introduction to critical thinking and sociological analysis. Evaluation of popular and sociological interpretations of social phenomena. Analysis of computerized data sets. Topics covered and assignments vary with instructor. General Education CORE, Critical Thinking. (2 lecture; 2 lab hours)

25. Quantitative Methods in the Social Sciences (3). Introduction to quantitative methods as an aid to the understanding of research in the social sciences. Application of basic descriptive and inductive statistics to the social sciences. (2 lecture; 2 lab hours)

111. Sociology of Minority Relations (3). Dominant and minority group relations historically, cross-culturally, and in contemporary American society. Primarily, the bases examined are in terms of ethnicity-race, religion, nationality, country-of-origin, nativity, and language — and secondarily the bases are non-ethnic such as age and gender. General Education CAPSTONE Cluster.

112. Collective Behavior (3). An examination of types of collective behavior: crowds, mobs, panics, publics, fashion, fad, social movements, and transient and anonymous relationships; their increasing importance in modern society where violence, conflict, and social unrest are common.

122. Social Movements (3). Theory of nonviolent direct action in the pursuit of social justice and social change. Discussion of goals, ideology, norms, organizational structure, leadership, strategy, tactics, and social roots of social movements.

130W. Contemporary Social Issues (3). Prerequisite: Engl 1. A sociological perspective is used to examine currently debated public issues. Often public issues involve present or proposed public policies; the impact of these policies on different segments of society is assessed. Meets the upper-division writing skills requirement for graduation.

131. Sociology of Sex Roles (3). (Same as W S 131.) The roles of women and men in contemporary social life, socialization and adult life — work roles, nuclear family, and other roles. General Education BREADTH, Division 9.

132. Women and Work (3). (Same as W S 132.) An examination of women and work in contemporary society, including housework, labor force participation, employment in various occupations, and career planning.

142. Sociology of Popular Culture (3). Impact of popular media on modern society. Includes movies, television, fiction, and other forms of popular culture. The meaning, the creation and production, and the future of popular culture. General Education CAPSTONE Cluster, Critical Thinking.

143. Deviance and Control (3). Rule-breaking behavior (such as crime, delinquency, mental illness) and responses to it. Examines deviance as a social phenomenon, its causes and consequences, and formal and informal social control activities. General Education CAPSTONE Cluster, Critical Thinking.

144. Social Policy Analysis (3). Interdisciplinary social science methods for approaching local and national social prob-

lems. Analysis of selected public issues emphasizing evaluation of social costs and benefits of alternative policies.

145. Social Organization (3). Prerequisite: Soc 1. Study of the nature of social organizations, their types and varieties, and the factors producing their different forms. Causes of the growth and decline of social organizations. Problems of centralization, authority, communication, and conflict in organizations.

146. Sociology of Work (3). Work in modern industrial society, employment and unemployment, formal and informal characteristics of work, the relationship between work and leisure, and the investigation of work satisfaction and alienation.

147. Medical Sociology (3). Political and economic organization of American medical health care system and cross-cultural comparisons. Analysis of social relations and interactions among members of the health professions affecting designations of persons as ill and their subsequent treatment.

148. Sociology of Education (3). A sociological examination of education as an institution, including its social determinants, functions, and consequences.

149. Sociology of Business (3). The social origins and development of business as an institution. Comparative studies of diverse impacts of business on society. Analysis of resulting ideological, political, and regulatory reactions to business. General Education CAPSTONE Cluster, Critical Thinking.

150T. Special Topics Seminar (1–3; max total 9). Prerequisite: permission of instructor. Topics include those areas of advanced theoretical and empirical studies that will orient the student to contemporary sociological endeavors.

151. Social Classes and Inequality (3). Prerequisite: Soc 1. Analysis of evaluational differentiation leading to social stratification. Criteria for differentiation, bases for evaluation, types of stratification, composition of strata and status systems, mobility, consequences of stratifications, and methods of studying stratification.

152. Classical Sociological Theory (3). Prerequisite: Soc 1. Evolution of classical sociological theories. Consideration of their origins in society and culture. Examination of such theorists as Marx, Weber, Durkheim, Comte, St. Simon, and Simmel.

153. Contemporary Sociological Theory (3). Prerequisite: Soc 1. Processes of theory construction. Major current sociological theories such as functionalist and conflict, interaction and interpretive, and behaviorist and exchange theories.

157. Social Change (3). Analysis of directions, patterns, and processes of social and cultural change.

159. Social History of Crime (3). Impact of social changes on crime and social control. Focus on United States and Western Europe. Topics include incidence and types of crime, rule-making and vindication, and organization of criminality. General Education CAPSTONE Cluster, Critical Thinking.

161. Population Analysis (3). Population theories and history; demographic processes and variables in contemporary society. Analysis of census data.

162. Social Psychology (3). Social factors affecting the development of social personality, attitudes and behavior. Basic social processes involved in interpersonal interaction. Demonstrations and student observations to increase an understanding of social processes in everyday life.

163. Urban Sociology (3). The urban concept; form and development of urban areas; scientific study of urban places and populations; effect of urbanization on social institutions and social relations. General Education CAPSTONE Cluster, Critical Thinking.

Education impacts your sense of identity . . . how you view yourself. You're never quite the same after a significant educational experience.

Santos Hernandez
Associate Professor, Social Work Education

164. Political Sociology (3). The social causes and effects of political phenomena. The roles of social classes, movements, and institutions in shaping the political process; examination of political behavior and attitudes.

165. The Family (3). The family in historic and contemporary society, theoretical frameworks for analyzing the family, family dynamics; changes in family functions, structures, and roles.

166. Social Gerontology (3). (Same as Geron 166.) Aging and the aged with special emphasis on urban American society; demographic dynamics; problems of the aged; gerontological research methodology.

167. Seminar in Self and Society (3). Prerequisite: Soc 1, 162, or Psych 134. Analysis of the relation of the self-system to society; symbolic interaction theory; role identity and social interaction; types of self developed under varying social conditions.

169. Sociology of Religion (3). Major sects, denominations, and churches; integrative and disintegrative processes in the United States; contemporary religious phenomena.

170T. Research Topics (1–3; max 6). Content of course will vary from semester to semester. Topics include an introduction to computer data analysis, a more in-depth discussion of computer data analysis, survey research, observational techniques, measurement, sampling.

174. Computer Data Analysis (1). An introduction to the use of one of the most widely utilized computer packages in the social sciences — SPSS (Statistical Package for the Social Sciences). No prior knowledge of computers is necessary. *CR/NC* grading only. (Formerly Soc 170T section)

175. Sociological Research Methods (3). Prerequisite: Soc 25. The research process with special emphasis on measurement, sampling, data collection, data analysis and report preparation. Basic assumptions and dilemmas of social science research. (2 lecture; 2 lab hours)

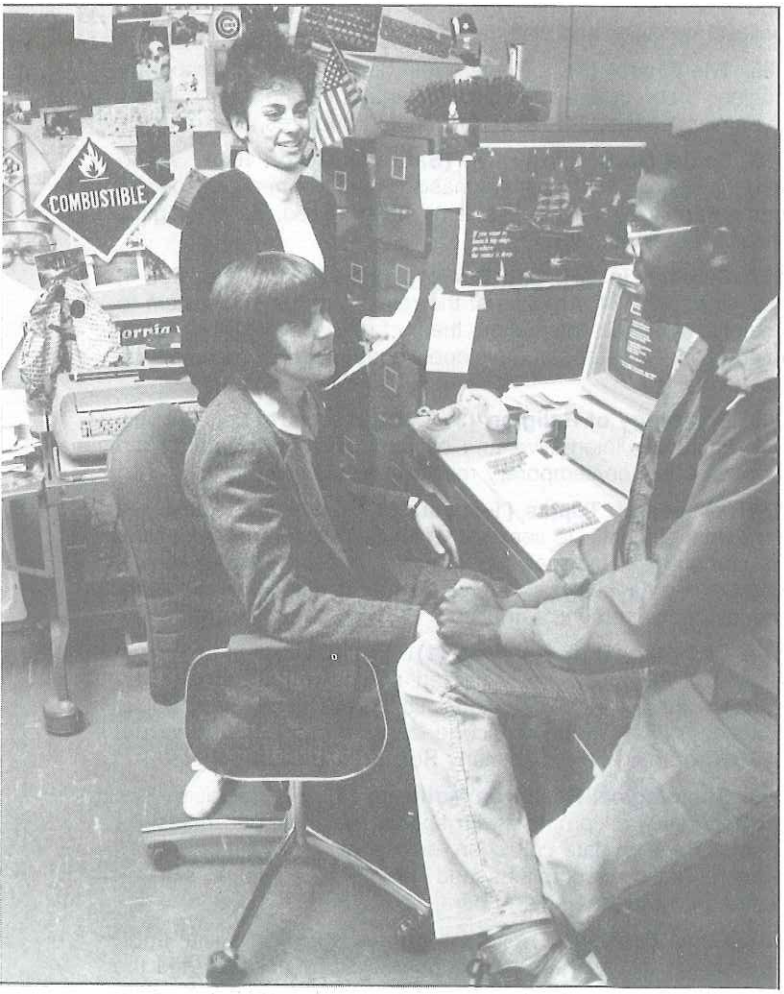
181. Small Groups (3). Small groups as basic social units. Description of the types of groups, how they operate, and the important variables affecting them. Observation and participation to increase understanding of the many small groups to which we all belong.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

Speech Communication

School of Arts and Humanities
Department of Speech Communication
John A. Cagle, Chair
Speech Arts Building, Room 15
(209) 278-2826

B.A. in Speech Communication
Minor in Speech Communication
M.A. in Speech
Option:
Speech Communication
Single Subject Teaching Credential in English/Speech Communication Skills for Professionals Certificate



Our aim is to prepare you to compete in, understand, and provide leadership in a world which is more and more a communication-oriented society.

We offer a balance of humanistic and scientific instruction in communication skills people need to function effectively in teaching, business, law, the communication professions, public service and administration, the ministry, public relations, politics and management. You have an opportunity to explore the full range of human communication.

Our major and minor are well grounded in interpersonal skills, in problem-solving and decision-making methods, and in group and organizational leadership. We study issues such as how we perceive events, express ourselves verbally and nonverbally, and how communication influences human behavior and social developments. We develop skills in oral and written communication, statistics and research methods (including using computers), and how to employ these skills in specific career areas.

A new Communication Skills for Professionals Certificate program is designed to enable students to achieve recognition of development in such areas as presentational speaking, problem solving and decision making, leadership, and interpersonal communication.

Our program offers a variety of exciting activities to enrich your educational experience. We have a fine intercollegiate forensics program of debate and individual speaking. We host a national communication conference each spring that brings scholars and students from around the country.

We offer you personalized advising. Our major builds on a sound core of foundation courses, but is completed by courses selected to meet your needs and career objectives, often with a minor in an appropriate field. We think your choice of an adviser is an important decision, and we encourage our students to pick their own adviser. You'll find we're glad to talk with you.

Career Opportunities

In the "Information Age" of the 1990s, a degree in speech communication can open a great number of career doors. Increasingly, we see a wide variety of job descriptions across professional disciplines which list *skills in communication* as the highest priority. An essential goal for us is to help you develop these very important communication skills. In addition, we try to provide an educational base for our majors and minors for specific careers requiring competencies in oral and written communication and in interpersonal and managerial communication.

Speech Communication graduates are employed as public relations consultants, personnel managers, political campaign directors, management analysts, teachers, counselors, lawyers, ministers, human resource specialists and marketing representatives. We offer students a discipline widely suited to today's uncertain job market. National placement studies reveal that communication majors are finding jobs with reasonably high job satisfaction and above average pay rates, and that their rate of promotion is significantly faster.

The pursuit of a career is of great concern to students today, but it is important to recognize that the quality of your education will determine your success in life as well as how to make a living. More than half of college graduates do not enter fields directly tied to their majors.

As you begin your university education, and as you begin making decisions about your life and what you want to do with it, please remember that we will be happy for you to join us in the most exciting and fundamental discipline of all — the study of human communication.

Faculty

John A. Cagle, *Chair*

Katherine L. Adams
R. Gene Anderson
Constance C. Bacon
Melanie M. Bloom
Vincent L. Bloom
Hal W. Bochin
Carl W. Carmichael
George E. Diestel
L. Ralph Hennings
David T. Natharius
David F. Quadro
Steven L. Renshaw
Gail A. Sorensen
W. Richard Ullmann

Graduate Adviser: Katherine L. Adams
Undergraduate Adviser: Hal W. Bochin
Credential Adviser: R. Gene Anderson

Bachelor of Arts Degree Requirements

Speech Communication Major

The Speech Communication major is designed to develop broad-based competencies not only in oral and written communication, in critical analysis, and in statistics and research methods, but also emphasizes how to employ these skills in specific contexts such as business management, political persuasion or public relations. With your program adviser, you may select a concentration track to fit your particular interests and professional aspirations. The *professional track* is designed to prepare students for advanced study in communication, law and government, ministry, education (credential candidates should see section on Teaching Credential Program) and other professions. The *organizational/applied study track* is designed to prepare students for careers and/or advanced study in business, public service and administration, public relations, social services and management. The *communication studies track* is designed to provide the student with a broad range of human communication skills applicable to a wide range of career interests.

	Units
1. Major requirements	45
Lower-division core: Spch 3, 4, 5, 7, 8	(15*)
Upper-division core: Spch 100 and 140	(6)
Concentration: Select one track	(12)
Professional: Spch 103, 105, 114, 142, 146, 148, 160, 162, 166, 179, 190	
Organizational: Spch 103, 106, 108, 160, 162, 163, 165, 166, 167, 168, 169, 170, 176, 179, 190	
Communication Studies: Select three courses from each of the other tracks (includes breadth requirement)	
Upper-division breadth (select two courses from track other than concentration)	(6)
In the Organizational track, select from: Spch 105, 114, 142, 146, 148	
In the Professional track, select from: Spch 106, 108, 163, 165, 167, 168, 169, 170, 176	
Electives: Select from any upper-division Speech Communication course cited above and/or from Spch 115, 120, 164, 188T, 189	(6)
2. General Education requirements	51
3. Electives and remaining degree requirements (see *Degree Requirements*) may be used toward a dual major or minor	28–34*
Total	124

* Spch 3 and 4 may be used to satisfy general education requirements; thus the number of elective units may vary from 28–34.

Notes:

1. No more than 3 units from Spch 15 and 115 can count toward fulfillment of the speech communication major.
2. *CR/NC* grading is not permitted in the speech communication major with the exception of Spch 179 (Internship).
3. General Education and elective units may be used toward a dual major or minor (see *Dual Major*, or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
4. No more than 6 units of Spch 179 (Internship) may be applied toward completion of the speech communication major.
5. Students are allowed only 3 units of Spch 190 and no more than 6 units toward the baccalaureate degree.

Speech Communication Minor

Increasingly, oral and written communication, problem solving and decision making, leadership, and conflict resolution skills are being recognized as vital skills for professionals in all fields of work. The speech communication minor is designed to develop these competencies in order to help students better meet their particular career goals. While a specific minor is recommended, you may wish to consult with your department adviser about designing a minor to suit your special objectives.

	Units
A. Core requirements	
Spch 5, 7, 8, 140, 160	15
B. Personal and Professional Development	
Spch 108, 162, 163, 167, 168 (select one)	3
C. Ideas and Issues	
Spch 142, 146, 148 (select one)	3
	21

Teaching Credential Program — English/Speech

The following 52 unit course of study, referred to as the English/Speech Single Subject Waiver Program, will be accepted by the department as a major in speech communication. The teacher education student will take the following courses:

General Education Prerequisites: Spch 3, 4; Drama 22

Credential Program: Engl 182, 189, 193T; Ling 135, 146; Spch 5, 7; either Engl 161, 163, or 164; either Engl 154 or 155; one from a selected list of literature courses in English; Spch 140, Spch 8, Spch 115; Spch 100 or 160; Spch 108 or 162; and either Spch 142, 146, or 148.

See School of Education for additional professional education requirements for a credential.

Students wishing to pursue a course of study leading to a teaching credential should see the departmental director of teacher education for advising early in their programs as state requirements change frequently.

Communication Skills for Professionals Certificate

Proficiency in communication skills is essential in virtually any professional career. The Speech Communication Program offers a structured sequence of courses leading to a certificate of special study recognizing the focused development of professional communication skills in such areas as presentational speaking, problem solving and decision making, leadership, and interpersonal communication. Upon completion of the certificate requirements, the department will award a certificate.

Certificate Prerequisites: upper-division standing and completion of the basic speech requirement in General Education.

Certificate Requirements: *Check with department prior to beginning certificate requirements regarding program status.*

	Units
Communication Theory (Spch 100)	3
Professional Writing Skills (IS 105W, Engl 164, 166, Jour 126, TCOM 120)	3–4
Business and Professional Speaking (Spch 170)	3
Communication Training and Development (Spch 176)	3
Elect 6 units from Spch 103, 108, 162, 167, 168, 169	6
Total	18–19

The new Communication Skills for Professionals Certificate program is designed to enable students to achieve recognition of development in such areas as presentational speaking, problem solving and decision making, leadership, and interpersonal communication.

Graduate Program

The Master of Arts degree program in speech is designed to extend the competency of persons engaged in theatre, speech communication, or the teaching of speech arts. The courses are designed to provide opportunity for comprehensive study at the advanced level in the various areas.

Master of Arts Degree (in Speech) Requirements — Option in Speech Communication

The Graduate Program in Speech Communication is designed to extend the competencies of students in the study of human communication. The Master of Arts Program in Speech has two options, one in speech communication and one in theatre arts.

The Graduate Program in Speech Communication assumes undergraduate preparation equivalent to a CSU, Fresno major or minor in speech communication. Under the direction of a graduate adviser, each student prepares and submits a coherent program individually designed within the following framework:

	Units
1. Spch 200	3
2. At least 6 units from each of the following lists	18
A. Spch 215 (Topics in Rhetoric and Public Address), 241, 242, 243, 244	
B. Spch 215 (Topics in Communication), 262, 263, 264, 265, 268	
3. One of the following:	
A. With thesis	
(1) Approved electives	3
(2) Spch 299 — Thesis	6
B. With comprehensive examination	
(1) Approved electives	9
(2) Comprehensive examination	0
C. With project	
(1) Approved electives	3 or 6
(2) Spch 298 — Project	3 or 6
Total	30

COURSES

Speech Communication (Spch)

AR. Study Skills Development (2). Development of communication skills necessary for successful learning in a university, including reading, library research, control of anxiety, critical analysis, listening, oral and written reports. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

3. Fundamentals of Public Communication (3). Theories of human communication and their function in contemporary public settings; experiences designed to enhance fundamental communication skills — research, organization, reasoning, listening and problem solving — through a series of oral presentations. General Education CORE. (CAN SPCH 4)

4. Introduction to Interpersonal Communication (3). Introduction to various theories of interpersonal communication; participation in experiences designed to enhance competence in interpersonal relationships. General Education BREADTH, Division 4.

5. Argumentation (3). Logical analysis, evidence, reasoning and proof used in arriving at rational decisions as demonstrated through presentation of public speeches and debates. General Education CORE, Critical Thinking. (CAN SPCH 6)

7. Persuasion (3). Analysis and practice of the use of persuasion as a social tool for resolving controversy and forming opinions from the perspectives of both the persuader and the persuaded. General Education CORE.

8. Group Discussion (3). Communication in group thinking and problem solving through preparation and presentation of panels and symposia on public issues. General Education CORE.

10T. Topics in Speech (1–3; max total 9). Contemporary problems and issues in speech communication; sections include such topics as freedom of speech, parliamentary procedure, special communication skills, rhetoric of protest and response, and communication processes.

15. Forensics Laboratory (1–2; max total 4). Experience in the presentation of debates, oral interpretation programs, persuasive and expository speaking. Intramural and intercollegiate competition in forensics.

100. Theories of Human Communication (3). Survey of major theories of human communication, philosophical issues, and applications; theories include interpersonal, group, organizational, intercultural, linguistic and persuasion.

103. Advanced Public Speaking (3). Advanced principles of expository and persuasive speaking; development of skills through analysis, preparation, organization and delivery of various types of speech.

105. Argumentation Theory (3). Analysis of the theories and techniques of argumentation, including models of argument, relationships between persuasion and argumentation, and the effects of argumentative discourse.

106. Statistical Applications in Communication (3). Introduction to elementary statistical concepts, correlation analysis, parametric and nonparametric tests; emphasis on the application of statistical procedures to communication research.

108. Communication and the Small Group (3). Analysis of group communication theories and their application to small

group behavior in specific variables such as leadership, power, conflict-resolution, conformity, cohesiveness and related group processes.

114. Communication and Learning (3). (Same as T Ed 158.) The nature of communication and its relationship to learning and instruction; management of oral communication strategies in the educational setting.

115. Advanced Forensics Laboratory (1–2; max total 6). Experience in the presentation of debates, oral interpretation programs, persuasive and expository speaking. Intramural and intercollegiate competition in forensics.

116. Communication and Humor (3). Develop your sense of humor and learn to incorporate humor into your world by examining humor theories, social and personal functions of humor. Focuses on (1) stand-up comedy, writing and presentation, or (2) application of techniques for management, sales, marketing, teaching, and health related fields. (Former Spch 188T section)

120. Female-Male Communication (3). Exploration of gender variables that affect human communication behaviors, focusing on behaviors that have some mythical or factual bases in sex similarities and differences. (Former Spch 188T section)

140. Rhetorical Theory (3). An examination and analysis of significant theories and theorists of rhetoric from the classical to the modern period. Emphasis on preparation of research papers reflecting rhetorical principles of communication.

142. Rhetorical Criticism (3). An examination of classical and contemporary principles of rhetorical criticism. Preparation and presentation of written analyses utilizing these principles in analyzing and evaluating rhetorical events.

146. British Political Communication (3). A systems approach to the study of British institutions and communication. Study of government, press, broadcasting, education and the criminal justice system to facilitate instruction in the evaluation of political messages. Emphasis given the 18th, 19th and 20th centuries.

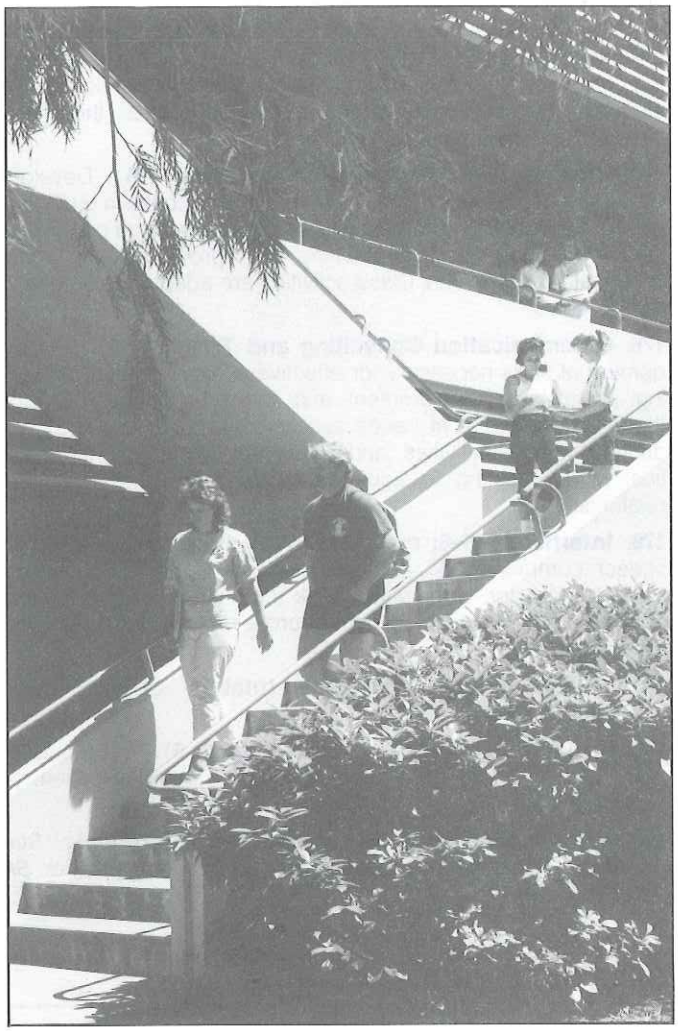
148. American Public Address (3). An examination of significant American speakers and speeches set in an environment of social and political history. The course is designed to acquaint students with the role of public address within the forces of American history.

149. Freedom of Speech (3). Examines the tradition of freedom of speech and expression in the American democracy. Focuses upon the First Amendment to the Constitution and major case laws which impact contemporary standards for public discourse, politics, broadcast and journalism.

160. Meaning, Language, and Communication (3). A review and analysis of the various approaches to the study of human symbolic behavior, with focus on such theories as: General Semantics, Psycholinguistics, Sociolinguistics, Epistemology, and other philosophical and scientific enquiries into the nature of language and meaning.

162. Interpersonal Communication (3). Nature of the communication process; factors affecting the process and the individuals involved.

163. Social Influence and Attitude Change (3). Seminar on the nature and effects of social influence, with special emphasis on attitude formation and change, conformity, behavior, "brain washing," prejudice and propaganda as functions of communication.



164. Intercultural Communication (3). Analysis of cultural variables and factors in the communication process and strategies for the resolution of intercultural problems; consideration of implications for education and programs necessarily involving intercultural communication.

165. Computer Applications in Communication (3). Study and use of various computer systems available in the study of human communication: Fortran IV, coursewriter III, LISP, SNOBOL, *General Enquirer;* emphasis on processing verbal data.

166. Communication Research Methods (3). Application of behavioral research principles to problems in quantification, design and analysis of data in communication research.

167. Leadership in Groups and Organizations (3). Theory and practice of selected leadership variables in groups andor-ganizations; functions of leadership in formal and informal structures, understanding and analysis of role-playing techniques.

168. Communication in Organizations (3). Examination of organizational communication from a multiple discipline perspective. Through the study of theory and experiential learning in simulations, students develop skills necessary for planning, staffing, developing, decision-making and problem-solving in organizations.

169. Communication and Conflict (3). Examination of the role of communication in conflict in interpersonal, small groups, organizational and societal settings. Through experiential learning, case-study analyses, and practice of intervention skills, students address conflict styles, strategies, tactics, third-party intervention and mediation techniques.

170. Business and Professional Speaking (3). Development of communication skills necessary for success in business, government and the professions. Includes theory and practice of interviewing, job instruction training, work group leadership and proposal presentations. Class activities are adapted to students' career goals.

176. Communication Consulting and Training (3). Development of skills necessary for effective communication consulting in business, government and the professions. Includes theory and practice of needs assessments, planning and conducting training activities, and evaluation of educational activities; topics relating to adult education and client-consultant relationships.

179. Internship (1–6; max total 12). Prerequisite: major in speech communication, at least 75 units completed and permission of instructor. Supervised work experience in government, business, social agencies or non-profit organizations. *CR/NC* grading only.

188T. Topics in Speech (1–3; max total 9). Selected topics in speech communication.

189. Projects in Speech (1–3; max total 6). Prerequisite: permission of instructor. Projects in speech communication. (4 hours activity)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

GRADUATE COURSES

(See *Course Numbering System*.)

200. Introduction to Graduate Study (3). Seminar in research procedures and materials. Required of all majors during the first semester of graduate work.

214. Seminar in Communication Education (3). An examination of the relationships of learning theories to communication study and research. Research in instructional communication, teaching strategies in communication education, and techniques for applying these concepts in educational and training settings.

215. Seminar in Speech Arts (3; max total 9). Research and individually directed work within one area of specialization. Approved for *SP* grading.

241. Seminar in Rhetorical Theory (3). A seminar which deals with the development of specific principles by selected theorists.

242. Seminar in Contemporary Criticism (3). The role of rhetorical criticism in contemporary society.

243. Seminar in the History of American Public Address (3). A detailed study of selected men and women who have influenced political, religious, and social problems in American History.

244. Seminar in Contemporary Public Address (3). The study of contemporary figures in public address who have influenced political, religious, economic and social problems in the 20th century.

262. Seminar in Communication Theory and Research (3). An examination and evaluation of mathematical, philosophical, sociological, psychological and rhetorical theories of human communication. Emphasis upon the assumptions and implications of various theories, models and constructs.

263. Seminar in Group Communication (3) A critical examination of the scientific research and theories in group communication including research variables and methodologies. Implications of research findings for contemporary communication problems.

264. Seminar in Communication Research Methods (3). The nature, implications and assumptions of methodologies in human communication research. Discussion of quantification, design and statistical inference as they relate to experimental, quasi-experimental, descriptive, survey and case study methodologies.

265. Seminar in Interpersonal Communication (3). An examination of current quantitative and qualitative theory and research in interpersonal communication. Implications and applications to various kinds of human relationships and various aspects of those relationships, e.g., stages, relational communication, attraction, conflict, self-disclosing.

268. Seminar in Organizational Communication (3). Theory and application of organizational communication, including interpersonal and group communication in planning, staffing, development and decision making in complex organizations; organizational systems and environments; recognizing, diagnosing and solving organizational problems.

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

298. Project (2–6; max total 6). Prerequisite: prior advancement to candidacy. See *Criteria for Thesis and Project*. Preparation, design, conduct, and evaluation of project applying rhetorical and communication theories; e.g., communication campaign for public agency, communication audit of corporate organization, extensive consulting or training activities, etc. Requires scholarly report similar in format to thesis and final oral defense. Approved for *SP* grading.

299. Thesis (2–6; max total 6). Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System*.)

303. Topics in Speech (1–3; repeatable with different topics). Prerequisite: permission of instructor. Application of the theories in speech arts.

Telecommunications

School of Arts and Humanities
Department of Telecommunications
R. C. Adams, Chair
Speech Arts Building, Room 150
(209) 278-2628

B.A. in Telecommunications
Options:
Creative
Management
News/Public Affairs
Production
Minor in Telecommunications

The Telecommunications Program offers courses of study for those who seek careers in the media or in allied fields and for those who wish to pursue advanced study of mass communications. Students completing the program are prepared to pursue careers in such fields as commercial or public radio or television, new media technologies, and the cable industry. The program is based on study of the cultural, social, political, economic, educational, legal, and artistic significance of the media.

Internships

The program typically places 16 to 20 interns in local radio and television stations each semester, another six to eight every summer. Internships provide the opportunity to spend about one-quarter time in a facility working in capacities suitable to student background and interests just as if employed. The internship often is deemed suitable experience by small-market stations in their hiring decisions.

Facilities

KFSR-FM is a student-operated public radio station that serves as a training laboratory for aspiring radio broadcasters and as the voice of the university to the immediate community. A new student management team takes over each year and all students with an interest have the opportunity to work up through the ranks to vie for the top positions.

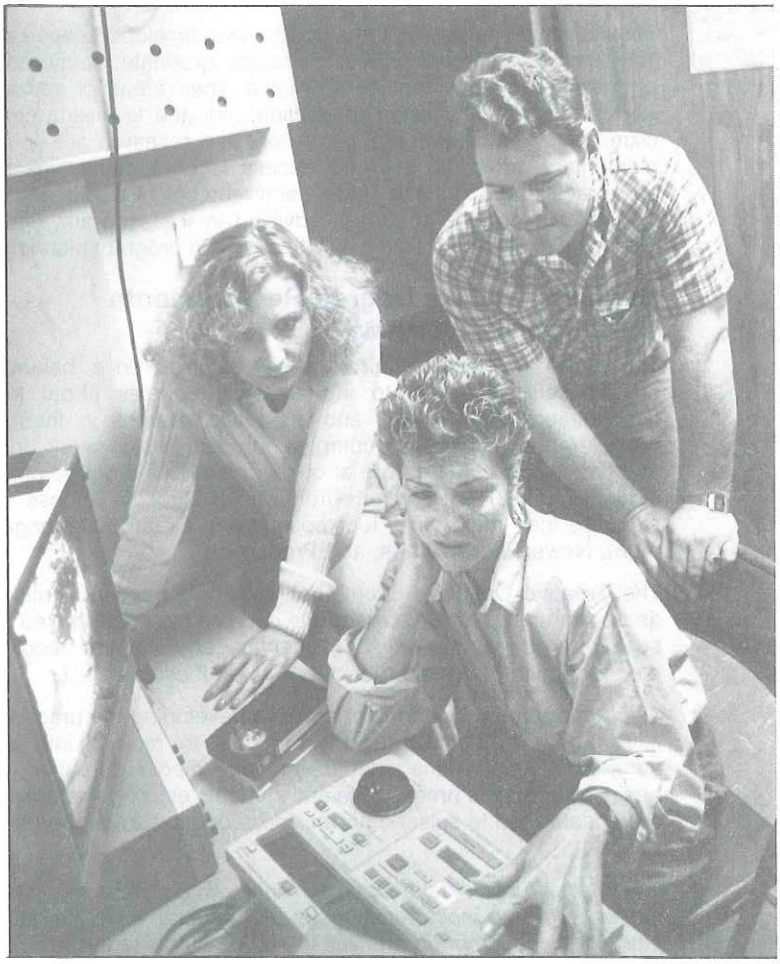
The on-campus television facilities provide a training laboratory for those who would be writers, performers, producers, or directors for the medium. Local cable television and the public broadcasting station provide live production opportunities and production experiences in program preparation and taping for later transmission.

Special Scholarships

The Meredith Corporation, owners of KSEE-TV 24 in Fresno, provides one $2,000 scholarship to a student preparing for a career in broadcasting, who is a member of a federally protected minority. Because the Telecommunications faculty maintains an institutional membership in the Broadcast Education Association, all majors are eligible to compete for scholarships offered by the National Association of Broadcasters. These currently include the Harold E. Fellows Scholarship — four national awards of $1,250 each to support study in any area of broadcasting; the James Lawrence Fly Scholarship — one national award of $2,500 available to juniors, seniors, graduate students, and law students; the Walter Patterson scholarship — two national awards of $1,250 each to support preparation for a career in radio; the Broadcast Pioneers Scholarships — two national awards of $1,250 to support juniors, seniors, and graduate students studying any area of broadcasting; and the Shane Media Scholarship — one national award of $3,000 to support preparation for a career in radio.

Career Opportunities

Departments of communications are growing on university campuses across the country. This reflects the perception of those who study job markets that communication is increasingly recognized as a primary factor in all forms of work. Students graduating with a B.A. in Telecommunications work in radio and television stations. They also find ready opportunities in advertising agencies, independent production companies, public relations firms, and in businesses and agencies that use these kinds of services.



Faculty

R. C. Adams, *Chair*

H. Lee Alden
Rita A. Atwood
Joel P. Fowler
Russell A. Hart
Philip J. Lane
William N. Monson
James R. Wilson

Bulldog Video: Joel P. Fowler
KFSR-FM *Faculty General Manager:* James R. Wilson
Mass Communications Graduate Program Coordinator: Philip J. Lane
Scholarship Assistance: Rita A. Atwood
Student Placement Liaison: James R. Wilson

The individual members of the faculty have developed expertise in areas of personal interest through graduate study and professional employment in the media. Their areas of special interest in radio, television production, film and television criticism, writing, management, regulation, and research are complementary, providing students access to competent thinkers and practitioners in these fields. Each member of the faculty is available to provide academic advising in the program; each student is expected to obtain faculty advice in program planning.

Bachelor of Arts Degree Requirements

Telecommunications Major

The major in telecommunications is premised on a balance among courses taught to impart skills, courses about the telecommunications fields, and academic courses in theory, criticism, and research. It comprises upper-division work only and has two parts: 1) a core of common courses required of all students and 2) four options from which students choose to structure their major. The four options are: Creative, Management, News/Public Affairs, and Production.

The Creative Option is oriented to developing critical, writing, and performance skills; prerequisite courses may be required in speech and drama and supplementary courses are recommended in literature and music as well as these areas.

The Management Option is oriented to developing the practical skills and the critical overview essential to moving into an administrative or managerial role in any media operation; a business course is prerequisite and students electing this option are encouraged to select other business courses to support the option.

The News/Public Affairs Option is oriented to developing skills and insights into those functions of the media that will facilitate entry into, and informed practice in, roles suitable to this area of broadcast and cable operation; drama, speech, and journalism courses may be included in the prerequisites and are recommended along with courses in agriculture, business, criminology, political science, and the natural and social sciences to support the option.

The Production Option is oriented to developing skills and critical abilities supportive of careers in producing/directing in all the media; drama courses may be prerequisite and are recommended to support the option.

Select the option that coincides best with your career aspirations and consult with a faculty member in the Telecommunications Program to select courses that will best assist you in reaching your career goals. Note which courses have lower-division prerequisites that must be satisfied; these should be included in the selection of suitable general education courses and preparation for entering the major.

Degree Component	Units
1. Major requirements	30
a. Required core: TCOM 110, 120, 140, 160, 195	(14)
b. Option requirements and electives	(16)
1) Creative: Required — TCOM 173, 180; Elective — 10 units selected from TCOM 115, 131, 151, 163, 186, 190; Drama 131, 133.	
2) Management: Required — TCOM 145, 185; Elective — 9 units selected from TCOM 115, 131, 148, 151, 165, 167T, 186, 190, 191.	
3) News/Public Affairs: Required — TCOM 148, 153; Elective — 9 units selected from TCOM 115, 131, 145, 150, 151, 167T, 175, 180, 186, 189, 190, 191; Jour 130, 183.	
4) Production: Required — TCOM 150, 155; Elective — 10 units selected from TCOM 115, 131, 151, 167T, 170, 175, 186, 189, 190.	
2. General Education requirements (including Engl 1 and 20, Psych 10, Soc 3, or their equivalents) chosen with the advice of a faculty member	51
3. General electives and remaining degree requirements (See Degree Requirements; may include a dual major or a minor)	43
Total	124

Notes:

1. Each TCOM major is expected to declare an option within the program; consult with your faculty adviser to do this. If you do not know who to consult, contact the undergraduate advising coordinator listed above.
2. While the TCOM major is composed of upper-division work only, note that some courses have lower-division prerequisites in the program or in the General Education offering that must be taken first. For example, the TCOM core has as prerequisites TCOM 10, 30 or 50, Engl 1 and 20, Psych 10, and Soc 3, or their equivalents. IS 50 is also highly recommended for Telecommunications majors. Your choice of option, and courses in the option, may require you to take other prerequisite courses.
3. TCOM 163 cannot be used to satisfy both a TCOM elective requirement in one of the options and a *General Education Popular Culture CAPSTONE requirement.*
4. TCOM majors are not permitted to enroll for ***CR/NC*** grading in courses that are to be counted in the major, except where mandatory — i.e., TCOM 186.
5. General Education and general elective units may be used to develop a dual major or a minor (see *Dual Major* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty member for further information.

Telecommunications Minor

	Units
1. Required core: TCOM 120, 140, 160	9
2. Select one of the required courses from your preferred option and any other three units available to you in the option; no more than 2 units in practicum courses may be included in the minor.	6
Total	15

Master of Arts Degree in Mass Communications

The graduate program leading to the Master of Arts degree in Mass Communications is based on undergraduate work in telecommunications, journalism, or an equivalent academic background. For requirements, consult the coordinator of the Mass Communications Graduate Program or the chair of the Department of Telecommunications, identified earlier. For courses, see *Special Programs*. Information about graduate study in the university may be obtained from the Office of the Division of Graduate Studies and Research.

COURSES

Telecommunications (TCOM)

3. Audio Equipment Lab (1). Instruction in principles, techniques, and practices for proper and safe operation of audio equipment in studio and control room environments. (2 3-hour labs, 5 weeks)

5. Video Equipment Lab (1). Instruction in principles, techniques, and practices for proper and safe operation of video equipment in studio and control room environments. (2 3-hour labs, 5 weeks)

7. Video Editing Lab (1). Instruction in principles, techniques, and practices for proper and safe operation of field cameras and edit stations. (2 3-hour labs, 5 weeks)

10. Media and Society (3). A survey of the social and institutional framework of contemporary media of communication based upon historical development of technologies, companies, and theoretical concepts. Emergence of regulation, identification of social influences, and contemporary standards of evaluation are also introduced. (Former R-TV 10)

30. Audio Production (3). Prerequisite: demonstrated proficiency with audio equipment through documented prior experience, prior coursework, or TCOM 3. Lecture and laboratory experiences in sound recording and transmission techniques as they apply to the recording industry, radio, film, and video. (2 lecture, 2 lab hours) (Former R-TV 30)

50. Video Production (3). Prerequisite: demonstrated proficiency with video equipment through documented prior experience, prior coursework, or TCOM 5; TCOM 30 or equivalent. Lecture and laboratory experiences in production techniques as they apply in television program development. (2 lecture, 2 lab hours) (Former R-TV 50)

70. Introduction to Film/Video (4). The basic principles and theories of Super 8mm filmmaking, single-camera video production, and editing techniques. A comparison of film and video as contemporary art forms. (4 hours lecture, discussion, demonstration; outside projects required) (Former R-TV 70)

80. Media Performance (3). Basic theories and techniques of broadcast and film performance. Lecture and laboratory experiences in vocal and visual aspects of performance; analysis and preparation of material for media performance. (2 lecture, 2 lab hours) (Former R-TV 80)

110. Media Problems and Practices (2). Prerequisite: TCOM 10 or equivalent. This course is an introduction to the day-to-day concerns of media professionals as they appear in current industry periodicals such as *Broadcasting* magazine. Subscription(s) required. (Former R-TV 110)



115. Media Stereotypes (3). (Same as Jour 115.) Prerequisite: upper-division standing. Survey of dominant TV stereotypes involving ethnic minorities, women and men, aged, handicapped, and others. Analysis of economic, social, cultural, and political factors that shape, maintain, and change TV stereotypes. Effects of stereotypes examined.

120. Writing for the Media (3). Prerequisite: TCOM 10 and 30, Engl 1 and 20, or equivalents. Required of majors, this course focuses on continuity types; writing and evaluation of announcements, commentaries, and program formats; adapting the written word to the aural/visual media. (2 lecture, 2 lab hours) (Former R-TV 120)

131. Radio Operations Practicum (1; max total 2). Prerequisite: TCOM 10 and 30 or equivalents; permission of instructor. Enrollees participate in the operation of the university FM radio station, on a scheduled basis, under instruction and supervision of program faculty. (1 lab, 4 arranged hours) (Former R-TV 131)

140. Media Audiences and Effects (3). Prerequisite: TCOM 10, Psych 10, and Soc 3 or equivalents. Required of majors, this is a study of recent and contemporary research addressing audiences for media and programs; effects of programs on audiences; uses of programs by audiences. (Former R-TV 140)

145. Audience Measurement (4). Study of survey research methods as employed in the broadcast ratings industry for stations, networks, and agencies; conduct of a local audience measurement project. (Former R-TV 145)

148. News/Public Affairs Analysis (4). Study of methods of content analysis as used to evaluate programs for emphasis, bias, style, comparison; conduct of an analysis of local news/public affairs programming. Project participation required. (Former R-TV 148)

150. Advanced Video Production (3). Prerequisite: TCOM 10, 50, 70, and Drama 34 or equivalents; *B* or better in prerequisite courses. Development of critical and creative skills; study of production theory and practice; participation in planning, organization, and production activities. (1 lecture, 4 lab hours) (Former R-TV 150)

151. Television Operations Practicum (1; max total 2). Prerequisite: TCOM 150; permission of instructor. Enrollees participate in television studio operations on campus and in the media community, on a scheduled basis, under instruction and supervision of program faculty. (1 lab, 4 arranged hours) (Former R-TV 151)

153. News/Public Affairs Laboratory (3). Prerequisite: TCOM 10, 30, Jour 8, l00W, and 128; permission of instructor. Characteristics of electronic news media; local and national broadcast news operations; news sources and resources; social influence; policy and control; planning and producing news and public affairs programs. (2 lecture, 2 lab, arranged hours) (Former R-TV 142, R-TV 153)

155. Television Directing (3). Prerequisite: TCOM 150; permission of instructor. Theories and practices in producing and directing television productions and programs; planning and production for the directorial function. Laboratory goal to create airworthy products for closed-circuit, cable, or broadcast distribution. (1 lecture, 4 lab, arranged hours) (Former R-TV 155)

160. Broadcast Regulation (3). Prerequisite: TCOM 10 or equivalent. Required of majors, the course examines philosophies and principles of mass communication control and their application to the electronic media, development of regulatory patterns in the U.S. media, and social responsibility of the broadcaster. (Former R-TV 160)

163. Radio/TV as Popular Culture (3). Prerequisite: must have completed 56 units. A consideration of the media as popular cultural arts through study of development of program forms, social influences. Programs are studied in script and recorded forms. Term paper required. General Education CAPSTONE Cluster, Critical Thinking. (Former R-TV 163)

165. Broadcast Programming (3). Study of strategies and practices in programming radio and television stations and cable television operations. Lecture, discussion, and analysis/evaluation are primary course methods. Term project and paper required. (Former R-TV 165)

167T. Media and Social Change (3; max total 6). Prerequisite: TCOM 10 or equivalent, upper division standing. In-depth examination of national and international social changes associated with electronic media and new technologies. Topics include Media and Development in Third World; International Broadcasting; TV and Global Politics; New Communication Technologies.

170. Advanced Video Field Production (3). Prerequisite: TCOM 50, 70, and 120 or equivalents; *B* or better in prerequisite courses. Advanced study of the planning, organization, and execution of video field-production techniques as used in corporate video and documentary program production; single-camera, film-style video techniques and postproduction. (2 lecture, 2 lab, arranged hours)

171. History and Development of Motion Pictures (3). Criteria for motion picture selection; use of reviews and judgments by critics and organizations; critical observation of films. Evaluations required. (Former R-TV 171)

173. Film/Television Criticism (3). Study of traditional and new critical approaches to film and their application to television; analysis and interpretation of films and television programs through humanist critical methodology. (Former R-TV 173)

175. Documentary (3). History and criticism of documentary in its various forms with emphasis on the analysis of techniques, methods, styles, purposes, and social significance in film and television. (Former R-TV 175)

180. Advanced Media Performance (3). Prerequisite: TCOM 80, Drama 22, and Spch 3 or their equivalents; permission of instructor. Theories and practices of performance in radio, television, film; refinement of professional skills and standards; laboratory goal is cable, closed-circuit, or broadcast performance. (2 lecture, 2 lab, arranged hours) (Former R-TV 180)

185. Proseminar in Media Management (3). Prerequisite: TCOM 160, 165, and B A 120 or equivalents; permission of instructor. Organization, operation, and administration of radio and television stations and cable television facilities; correlation of department functions; relation to regulatory agencies and the marketplace. (Former R-TV 185)

186. Media Internship (3; max total 6). Prerequisite: 15 upper-division units in TCOM program; permission of instructor. Applied practice in an area media outlet or an allied agency. On-the-job and faculty supervision/instruction; conferences and reports required. *CR/NC* grading only. (Former R-TV 186)

189. Media Projects (3; max total 6). Prerequisite: senior status in TCOM program; permission of instructor. Creative group projects in radio, television, film; public showing/airing or other distribution required. (6–8 arranged hours) (Former R-TV 189)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading. (Former R-TV 190)

191. Radio-Management Practicum (1; max total 2). Prerequisite: completion of one semester TCOM 131 with *B* or better; permission of instructor. Enrollees participate in management of the university FM radio station with a specific, assigned responsibility for an operational element, under faculty supervision. (1 lab, 4 arranged hours) (Former R-TV 191)

195. Proseminar in Media Issues (3). Prerequisite: senior standing, eligible for graduation. This major capstone course examines current issues affecting all phases of the media industries through discussions with local media executives and middle-management personnel and readings in current industry periodicals such as *Broadcasting* magazine; normally taken in the spring semester the degree requirements are completed. Subscription(s) required. (Former R-TV 195)

200 series. Graduate courses are listed under *Special Programs — Mass Communication*.

THEATRE ARTS
Drama and Dance

School of Arts and Humanities
Department of Theatre Arts
Ronald D. Johnson, Chair
Speech Arts Building, Room 33
(209) 278-3987

B.A. in Theatre Arts
Dance Option
Minor in Theatre Arts
(Drama)
(Dance)
Single Subject Teaching Credential:
English/Drama

The Theatre Arts major is designed to develop your skills in acting, directing, dance performance, choreography, playwriting, management, children's theatre, technical production, scene design, costume design, lighting design, history, literature and teaching. After completing our program you will have had the opportunity to develop the skills and techniques that will enhance your ability to pursue either an advanced degree or a professional career.

Our professionally trained instructors will guide you through a program which is not only educational but fascinating. A major or minor in theatre or dance can be one of the more exciting times in your life because it will develop communication and performing skills that will aid you no matter what career you finally decide to pursue. If theatre is what you want, then the CSU, Fresno Theatre Arts Department is ready to serve you.

The CSU, Fresno Theatre Arts Department is an accredited institutional member of the National Association of Schools of Theatre (NAST) and is a member of the American Theatre in Higher Education, United States Institute of Theatre Technology, California Educational Theatre Association, and the Southern California Educational Theatre Association. The department regularly participates in the American College Theatre Festival (ACTF) and the American College Dance Festival (ACDF). Students, faculty and productions have been awarded many regional and national honors from both ACTF and ACDF.

CSU, Fresno's national and international award-winning Theatre Arts Department offers you educational preparation in all aspects of theatre and dance. Besides having the opportunity of being guided by an extensive curriculum and production schedule of more than 10 plays and several dance concerts, you will have the opportunity to study with guest professionals who participate in our program on a regular basis.

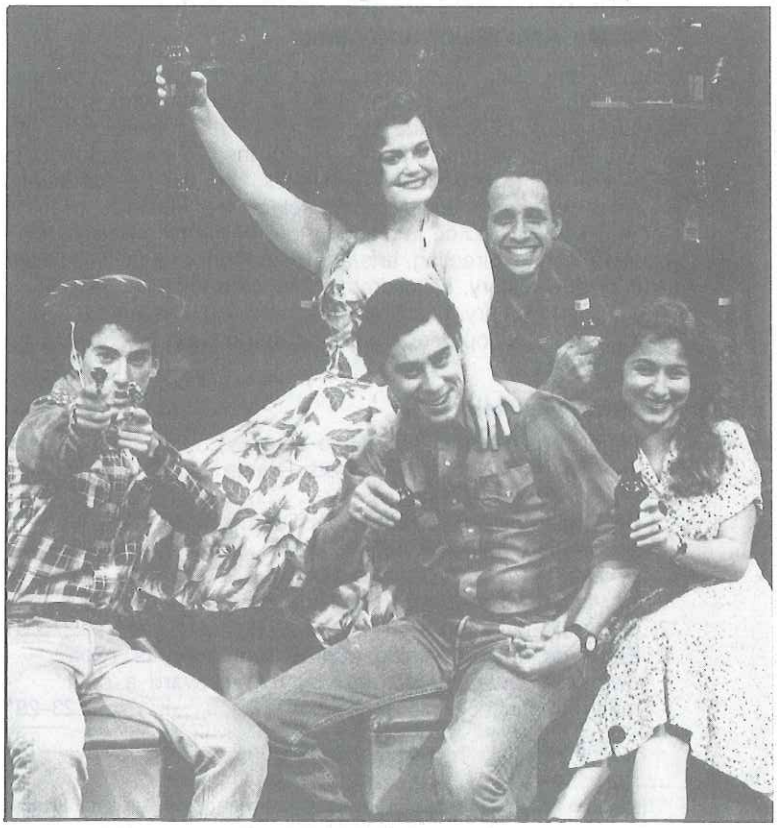
At CSU, Fresno you have a variety of production organizations, each providing a different kind of experience. University Theatre produces five major productions a year, cast and crewed by students. The Experimental Theatre Company (ETC) and the University Dance Theatre (UDT) are student organizations that produce their own plays and dance concerts. Playwrights Theatre is dedicated to the production of original plays. Theatre for Young Audiences, as its name implies, produces plays for young people, two of which tour throughout the Valley. You also have the opportunity to work with our resident dance company, The Portable Dance Troupe. As you can see, there are many formats for you to develop and practice your arts at CSU, Fresno.

Facilities

At CSU, Fresno you have the opportunity to study and practice your art with an outstanding faculty in well-equipped theatres and production facilities. Our complex consists of a 420 seat proscenium theatre, a 200 capacity arena theatre, a 100 capacity Lab Theatre, and a 6,000 capacity amphitheatre. You will work closely with fourteen faculty members who are current in their craft and professionally active in acting, directing, dance, design, technical production and management. Playwriting is a specialty of several of our faculty; all have published and two have been awarded Schubert Fellowships. As you might imagine, we encourage the production of original plays at CSU, Fresno.

Career Opportunities

Professional theatre and dance are very competitive areas especially for performers. Nevertheless, CSU, Fresno graduates have more than held their own as actors and dancers in the professional world. As designers, production specialists and managers, our students have readily found career opportunities. The rapid expansion in home video entertainment promises even more opportunity in the field.



Graduates have also found successful careers in related fields such as radio and television, journalism, rock performances and touring productions. Many graduates teach in high schools, community colleges and universities. Several former students have found their theatre training as an asset in such careers as law, theology and politics.

Faculty

Ronald D. Johnson, *Chair*

Howard H. Brewer
Jeanette P. Bryon
Dan Carrion
M. C. Drake
Edward F. EmanuEl
Gaylord O. Graham
Ruth H. Griffin
Janet Loring
Kathleen S. McKinley
Terry C. Miller
Kim V. Morin
Bradley J. Myers
Charles H. Randall
Lois M. Trostle
Phillip N. Walker
Robert G. Ware

Dance Option Coordinator: Lois M. Trostle
Graduate Adviser: Bradley J. Myers
Credential Adviser: Kim V. Morin

Bachelor of Arts Degree Requirements

Theatre Arts Major and Minor

The theatre arts major and minor are designed to provide competencies in the theatre arts for students who intend to pursue study beyond the Bachelor of Arts degree, who are preparing for careers in teaching or for the professional theatre. With the assistance of their advisers and with departmental approval, students may, by proper selection of electives, prepare themselves for service in one or more of the following specializations: acting/directing, arts administration, dramatic literature and theatre history, child drama, oral interpretation, technical/design, elementary or secondary teaching credential. These patterns of development should be determined in consultation with advisers.

Theatre Arts Major *Units*

1. Major requirements (see Note 1 below): 50
   - *a) Lower-division requirements:* Drama 10, 33, 34, Dance 20 .... (12)
   - *b) Upper-division requirements:* Drama 134A, 134B or 181A, 135, 139, 163, 185, 186 .... (21)
   - *c) Drama 15–115* .... (8)
   - *d) Approved electives* (see Note 2) .... (9)
2. General Education requirement 51
3. Electives and remaining degree requirements (See *Degree Requirements);* may be used toward a dual major or minor 23–29*

Total 124

* This figure takes into consideration that a maximum of two General Education BREADTH courses may also be applied to satisfy theatre arts major requirements (see *General Education).* The two courses that may be selected are Drama 34 and 163. Consult the theatre arts department chair or faculty adviser for additional details.

Notes:

1. New majors must enroll in Drama 10 (fall) and Dance 20 (spring) during their first year in the program.
2. Students must meet with their adviser each semester for program approval.
3. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy Theatre Arts major requirements.
4. *CR/NC* grading is not permitted in the theatre arts major.
5. General Education and elective units may be used toward a dual major or minor (see *Dual Major,* or departmental minor). Consult the appropriate department chair, program coordinator or faculty adviser for further information.

Theatre Arts Major (Dance Option) *Units*

1. Option requirements 55
   - a) Drama 15–115 (4 units), 33, 34, 134B or 181B or 182A .... (13)
   - b) Dance 20, 159, 164A–B, 166, 167, 168, 170, 171, ... (30)
   - c) Dance 117A, B, C, or D (must enroll in one section each semester) .... (6)
   - d) Dance 158A, B, C, or D (must enroll in one section each semester) .... (6)
2. General Education requirements 51
3. Electives and remaining degree requirements (see *Degree Requirements;* may be used toward a dual major or minor 18–24*

Total 124

* This figure takes into consideration that a maximum of two General Education BREADTH courses may also be applied to satisfy dance option requirements (see *General Education).* These two courses are Dance 171 and Drama 34.

Notes:

1. Special requirements: Students seeking the dance option are required to have competency in either Dance 117 (Modern) or Dance 158 (Ballet) for graduation.
2. A maximum of 12 units of dance technique courses (117, 118, 155, 158) may be credited toward the minimum B.A. graduation requirement of 124 units.
3. *CR/NC* grading is not permitted in the dance major.
4. General Education and elective units may be used toward a dual major or minor (see *Dual Major* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.

Theatre Arts Minor (Drama) *Units*

Drama 10, 30 or 31, 33, 34, 163	15
Drama 15–115	2
Approved electives (upper division)	3
	20

Theatre Arts Minor (Dance) *Units*

Dance 20	3
Dance 117A, 117B, 117C, 158A, 158B, 158C	8
Dance 166, 164A or B, 168, 170	9
Drama 115	1
Approved Electives	3
	24

Credential Program

Consult the teacher education department coordinator concerning the required course of study for the Single Subject Waiver Program in English/Drama.

Master of Arts Degree (In Speech) Requirements — Option in Theatre Arts

The graduate program in theatre arts is designed to extend the competency of students in the study and practice of theatre arts. The Master of Arts Program in Speech has two options, one in theatre arts and one in speech communication.

The graduate program in theatre arts assumes undergraduate preparation equivalent to a CSU, Fresno major or minor in theatre arts with adequate emphasis in the specialization selected for the graduate major.

Under the direction of a graduate adviser, each student prepares and submits a coherent program designed within the following framework:

	Units
1. Drama 200, 221, 231, 232, 233 and 240	18
2. Approved electives	9
3. Drama 298 (Project) or 299 (Thesis)	3
Total	30

COURSES

Theatre Arts (Drama)

1. Theatre Appreciation (1; max total 4). Open to non-majors. Understanding elements of theatre production through observation of a wide variety of staged productions. Discussion will stem directly from productions observed during the semester.

10. The Art of Theatre (3). Fundamental knowledge and skills required for study in the theatre arts program which includes the literary basis, technique, visual impact and presentation of drama.

15. Dramatic Arts Laboratory (1–2; max total 6). (Same as Drama 115.) Group laboratory experience in presentation of major productions for public performance. Not available for *CR/NC* grading.

22. Fundamentals of Interpretation (3). Discovering and communicating intellectual and emotional meaning of the printed page through preparation and presentation of selected readings from prose, poetry and drama. General Education BREADTH, Division 4.

30. Voice and Speech for Performance (3). Open to theatre arts majors and minors only. Principles of voice and speech for stage performance including the International Phonetics Alphabet, breathing, relaxation, resonance, enunciation, articulation, pronunciation, projection, expressiveness and vocal characterization.

31. Fundamentals of Voice and Articulation (3). Open to non-majors only. Principles of voice and articulation with demonstration in various aspects of oral communication.

32. Introduction to Acting (3). Not open to theatre arts majors. Fundamentals of improvisation, voice, movement and acting. Development of stage presence, and an introduction to characterization and dramatic text.

33. Fundamentals of Acting (3). Fundamental techniques and theories of acting; development of individual insight, skill and discipline in the presentation of dramatic materials. (CAN DRAM 8)

34. Theatre Crafts (3). Introduction to the crafts in technical theatre; scene construction, scene painting, property selection, stage lighting, sound production; costume construction and make-up; laboratory experience in preparing major plays for public performance. General Education BREADTH, Division 4.

35. Intermediate Acting (3). Prerequisite: Drama 33. Intermediate studies in acting including text analysis, expansion of the actor's character range and audition techniques.

62. Theatre Today (3). Not open to theatre arts majors. Perspectives on contemporary theatre forms and productions. General Education BREADTH, Division 5.

83. Touring Theatre (1–3; max total 6). (Same as Drama 183.) Prerequisite: permission of instructor. Experience in touring major productions for public performance.

89. Projects in Production (1–3; max total 9). (Same as Drama 189.) Prerequisite: permission of instructor. Group projects in all phases of production in laboratory theatre.

101. Theatre Appreciation (1; max total 4). Open to non-majors only. Understanding elements of theatre production through observation of a wide variety of stage productions. Discussion will stem directly from productions observed during the semester.

115. Dramatic Arts Laboratory (1–2; max total 9). (See Drama 15.) Not available for *CR/NC* grading.

131. Fundamentals of Playwriting (3; max total 9). Exercises in plotting, characterization, exposition, and stage business, critical analysis and revision of manuscripts.

133A–B. Advanced Acting (3–3 units). Prerequisite: Drama 35. (A) Advanced techniques of voice, movement, emotion, and characterization, developed through improvisation and scene study. (B) Period styles of acting. (Former Drama 133)

134A–B. Advanced Theatre Craft (3–3). Prerequisite: Drama 34. (A) Advanced training in scenic techniques and allied technology. Laboratory application to major public productions. (B) In-depth survey of each phase of the costume design and production process. Laboratory application to major public performances.

135. Make-up for Theatre (3; max total 6). Theory and practice of make-up for theatre; techniques for characterization, style, and technical processes. Emphasis on basic techniques; introduction to prosthetics. Preparing plays for major public performances.

136. Puppetry (3). Introduction to the art of puppetry: history, construction of various types of puppets and theatre, practice in manipulation, script writing, use of puppets in education and recreation.

137. Creative Dramatics (3; max total 6). (Same as T Ed 137.) Basic techniques for the use of dramatization in elementary education; socio-drama, dramatization of school subjects, creative dramatic play; simplified staging techniques.

138A–B. Children's Theatre (A-3) (B-3; max total 6). (A) Theory, practice and applications of theatre for children and adolescents; children's plays are examined through reading, discussion and scene study. (B) Prerequisite: permission of instructor. Theatre for Young Audiences Tour; experience touring children's theatre productions for public performance.

139. Fundamentals of Play Direction (3). Prerequisite: Drama 33. Fundamental techniques and theories of stage direction; function, responsibility, movement, analysis, style; practice in directing scenes.

140. Experimental Techniques in Play Direction (3). Experimental techniques of play direction: prerehearsal problems and procedures; structural analysis of plays, composition, picturization, pantomimic dramatization, movement, rhythm.

145. Women in the Theatre (3). (Same as W S 145.) Historical and contemporary perspectives and attitudes applied to women in the theatre arts including study of female artists, actresses, dancers, theatrical designers and technicians, directors and teachers.

150. Theatre Management and Promotion (3). Principles of organization, operation and administration of educational, com-

munity and professional theatre; box office operation, accounting procedures, ticket manipulation, house management, fund raising, promotional media. Supervised practical experience in dramatic art area production.

151. Stage and Production Management (3). Principles and techniques of stage and production management as applied to professional, educational and community theatre and applied media; production, audition, rehearsal process and organization; technical and performance process and procedures; production personnel and cost management. (Former Drama 188T section)

155. Sound in the Theatre (3). Theory, techniques and procedure necessary to develop and integrate sound, music, and effects in theatre production; hearing, acoustics, environment, sources, transducers, control, systems, equipment; organization and planning. Laboratory experience in preparing plays for a major public performance.

157. Theatre Graphics (3; max total 6). Development of rendering technique and other graphic skills essential to design for the theatre.

160. Field Studies in Theatre and Dance (1–6; max total 8). Prerequisite: permission of instructor. Supervised off-campus study of the theatre arts and dance. Submission of project or term paper required.

163. Dramatic Literature (3). Critical analysis of various types and styles of plays with respect to their form, meaning and theatricality. General Education BREADTH, Division 5.

178. Oral Studies of Shakespeare (3). Prerequisite: Drama 22. Appreciation and communication of representative histories, comedies and tragedies; problems of content and structure from the point of view of the oral interpreter.

179. Playwrights' Theatre (1–2; max total 6). Prerequisite: permission of instructor. Presentation and readings of original and classical plays.

180A–B. Scene Design for Theatre (3–3; 180B max total 6). Prerequisite: permission of instructor. (A) Styles, techniques and methods of scene design; history. Laboratory application, material for major public performance. (B) Scenery design; design problems of a complicated play; experimental ideas; new materials. Laboratory application, material for major public performance.

181A. Costume History for Theatre (3). A survey of historical periods of dress from early Egyptian civilizations to present day with an emphasis on application to stage usage.

181B. Costume Design for Theatre (3; max total 6). Costume design for theatre and dance incorporating analysis of script, research of historical period, selection of fabric, preparation of budget and rendering of plates. Emphasis on illustration and design elements.

182A–B. Stage and Television Lighting (3–3). Prerequisite: Drama 34 or 134A–B. (A) Instruments, control, color, electromechanical factors and simplified design and planning lighting leading to and resulting in a major public performance. (B) Lighting as an art, design concepts; lighting plots, projections, sequential cue relationships. Laboratory application, material for major public performance.

183. Touring Theatre (1–3; max total 6). (See Drama 83.)

185. History of the Theatre and Drama I (3). Prerequisite: Drama 163. History of European theatre and component arts from ancient Greece through the mid-nineteenth century; analysis of representative examples. General Education CAPSTONE Cluster.

186. History of the Theatre and Drama II (3). Prerequisite: Drama 163. From Ibsen to the present; analysis of representative examples.

188T. Topics in Theatre Arts (1–6; max total 9). Prerequisite: permission of instructor. Selected topics may include: acting, children's theatre, creative dramatics, play direction, technical theatre, theatre history, dramatic literature and theatre administration. (May include lab hours)

189. Projects in Production (1–3; max total 9). (See Drama 89.)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

194. Shakespeare (4). (See Engl 189.)

GRADUATE COURSES

(See *Course Numbering System.)*

290. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study*. Approved for *SP* grading.

298. Project (3). Prerequisite: See *Criteria for Thesis and Project.* Advancement to candidacy for the M.A. degree and permission of the Graduate Committee Chair. Individual project in a Theatre Arts specialty such as performance, play direction, playwriting, design, technical production, choreography and other creative works. Project requires documentation in a report format. Approved for *SP* grading.

299. Thesis (3). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

IN-SERVICE COURSE

(See *Course Numbering System.)*

303. Topics in Theatre Arts (1–3). In-service training in selected areas of drama/theatre arts.

Dance Courses (Dance)

A maximum of 12 units of dance technique courses (116, 117, 118, 155, 158) may be credited toward the minimum B.A. graduation requirement of 124 units.

20. Movement/Space (3). Fundamental theories and technique of movement for performance required for study in the Theatre Arts and Dance Option programs.

116. Introduction to Dance (1). Basic technique, improvisation and composition. Moving through space, energy and time with focus on varying internal and external stimuli as impetus for movement. General Education BREADTH, Division 4.

117A. Modern Dance Technique (1; max total 2). Prerequisite: permission of instructor. Basic aspect of modern dance technique. Emphasis on importance of breath, body alignment and rhythmic coordination; total movement awareness.

117B. Modern Dance Technique (1; max total 2). Prerequisite: permission of instructor. Beginning-intermediate level study of movement fundamentals, locomotor activities and expressive qualities; development of balance, strength, breath coordination and technical ability.

117C. Modern Dance Technique (2; max total 6). Prerequisite: permission of instructor. Intermediate level of modern dance technique; center practice and locomotor movement, stress on increased movement awareness through individual technical development and personal expression.

117D. Modern Dance Technique (2; max total 12). Prerequisite: permission of instructor. Advanced level in modern dance technique; elements of alignment, flexibility, strength, rhythm and energy flow. Exposure to techniques of Limon, Nikolais, Humphrey, Graham and others.

118. Tap (1). Combination of movement fundamentals and studies in rhythmic structures. Basic skills in tap dance and understanding rhythmic phrasing through percussive sounds of feet.

155A. Modern Jazz Dance (1). Prerequisite: Dance 116 or 158A. Rhythmic and stylistic devices of jazz and rock movement using modern dance technique as a movement foundation.

155B. Modern Jazz Technique (1). Prerequisite: permission of instructor. An in-depth study of jazz dance techniques and different jazz idioms; emphasis on individual style, freedom of expression.

158A. Ballet Technique (1; max total 2). Beginning level of ballet technique. Basic principles of tournout, plier, etentre, relever, sauter, tomber, tourner, muscular control and balance. Partial barre work, port de bras, adagio, centre barre, petit allegro and grand allegro.

158B. Ballet Technique (1; max total 2). Prerequisite: permission of instructor. Beginning-intermediate level of ballet technique. Introduction to important theories of French, Russian, Italian and Danish techniques. Extended practice of complete class; barre, port de bras, adagio, centre barre and allegro.

158C. Ballet Technique (2; max total 12). Prerequisite: permission of instructor. Intermediate-advanced level of ballet technique. Concentrated study and practice of French, Russian, Italian, and Danish concepts and theories of technique.

158D. Ballet Technique (2; max total 12). Prerequisite: permission of instructor. Advanced level of ballet technique. Advanced practice and study of French, Russian, Italian, and Danish concepts and theories of technique.

158P. Ballet Pointe (1). Prerequisite: permission of instructor. Advanced level of ballet technique and technical training for ballet pointe work. Advanced study of style and theory used for ballet pointe.

159. Music as Dance Accompaniment (3). Study of Western Classical Music Theory and History as it relates to dance exposure to world music. Rhythmic analysis and 20th century approaches to music composition and dance. Development of dancer's percussive and vocal abilities.

160. Creative Movement for Children (3). Introduction to the basic concepts, principles and methodology needed to develop an awareness of the aesthetic experience through dance and creative movement. The aesthetic qualities of dance are stressed to develop the use of creative intelligence and imagination.

161. Musical Theatre (3). Training of actors for musical auditions through fundamental voice and movement techniques, study of how music and lyrics combine to suggest character, and study of relationship of song, scene and choreography in various styles. (Former Dance 174T section)

The quality of training in both the academic and performance aspects of the CSUF theatre program is very high, and has proven invaluable in the pursuit of my goal to become — and remain — a professional actor.

Robert Westenberg
Alumnus from New York
Stage and Television Actor

162. Physical Theatre (3). Development of actor's physical instrument of flexibility, strength and control. Geared to extraverted physical theatre forms, i.e., Commedia Dell'Arte, Melodrama and Vaudeville. Scripts developed through ensemble improvisation. (Former Dance 174T section)

163. Portable Dance Troupe Company Class (2; max total 8). Prerequisite: permission of instructor. By audition only, held in fall semester and meets for two semesters. A repertory class consisting of rehearsing, understudying and performing roles. This laboratory experience leads toward performances and touring.

164A. Dance History: Classic (3). European dance beginning in the 16th century and its sequel, the classical and contemporary ballet.

164B. Dance History: Contemporary (3). Modern dance, its growth and development.

166. Dance Choreography (2; max total 16). Prerequisite: permission of instructor. Choreography is approached through the exploration of resources, including improvisation, use and development of ideas, knowledge of forms and development of craft. Choreography will be presented in class and performed.

167. Dance in Education (3). Prerequisite: permission of instructor. Unique potential found in movement for the development of creativity through the teaching of dance.

168. Effort/Shape (3). Prerequisite: permission of instructor. An introduction to the Laban system of movement analysis. Designed to include movement and observation, effort/shape analysis and the application of this work in the fields of education, performance, and therapy. (Former Dance 175A)

169. Body Image, Language and Non-Verbal Expression (3). An investigation into the nature of posture and gesture as configurations of expressive, non-verbal expression. (Former Dance 175B)

170. Centering and Alignment (3). A course designed to introduce a spectrum of models and concepts used in somatic analysis and movement facilitation. Emphasized is the use of images and thought to acquire efficient and safe alignment for ease of expression through dance.

171. Philosophical Bases and Trends in Dance (3). The elements and principles common to all arts and their relationship to dance. General Education BREADTH, Division 5.

173. Theories of Improvisational Movement (3; max total 9). Philosophical and physiological ideas in the possibilities of spontaneity as they relate to the actual process of human movement.

174T. Topics in Dance (1–3; max total 12). Selected topics may include: philosophy, psychology, art, theatre and music as related to dance.

Women's Studies

School of Social Sciences
Women's Studies Program
Susan S. Arpad, Coordinator
Social Science Building, Room 227
(209) 278-2858

Minor in Women's Studies



Women's Studies classes encourage students to develop critical and analytical thinking skills and the ability to communicate new ideas to a general public. Women's Studies students frequently say that Women's Studies classes enhanced their self-esteem and enabled them to more clearly define their special skills and talents. Therefore, all fields open to most social sciences and humanities graduates are open to Women's Studies graduates.

Career Opportunities

Students with a strong academic background in information about women find a growing number of career opportunities such as women's service agencies: displaced homemaker centers, rape counseling service, battered women's shelters. Students majoring in fields like gerontology, mass communications, nursing, recreation, criminology, economics, health sciences and social work, say that their major defines the field in which they will work; Women's Studies defines their special interest within that field. Postgraduate education in business, law, medicine, social welfare, psychology and education has provided many Women's Studies students with satisfying and challenging career opportunities.

Program Faculty

Women's Studies has its own full-time and part-time faculty, who come from a variety of disciplines: history, humanities, economics, sociology and psychology. In addition to this core faculty, many individuals teach Women's Studies courses in their home departments: anthropology, art, Chicano and Latin American studies, criminology, drama, education, English, ethnic studies, health sciences, history, philosophy, psychology, recreation and sociology. Saturday School faculty are most often chosen from the community-at-large on the basis of their particular area of expertise.

Minor Requirements

An interdisciplinary minor is available to any CSUF student. Each student's minor program is individually planned by the student in consultation with the Women's Studies program coordinator.

The minor in Women's Studies requires a minimum of 20 units, including W S 10 and W S 175. At least six units must be upper division. The other 14 units shall be selected from at least two different disciplines. In addition to the courses listed as regular offerings, electives may be chosen from special topics courses on women offered periodically by certain departments.

Certificate of Alcohol/Drug Studies

The Women's Studies Program is participating in a certificate of special study awarded to those students who successfully complete a minimum of 12 units of interdisciplinary academic coursework in the area of alcohol and drug abuse. (For complete details, see *Health and Social Work, Interdisciplinary Courses,* in this catalog.)

Victim Services Certificate

The Women's Studies Program is participating in a certificate of special study awarded to those students who successfully complete a minimum of 12 units of interdisciplinary academic coursework in the area of victim abuse. (For complete details, see the Criminology Department or the School of Education and Human Development.)

COURSES

Women's Studies (W S)

10. Introduction to Changing Women (3). Introductory interdisciplinary course designed to provide a foundation for Women's Studies; focus on women in the areas of sociology, psychology, history, economics, politics and the arts. General Education BREADTH, Division 9.

12. Critical Thinking About Sex and Gender (3). An introductory course for students who may not have had any formal coursework in either critical thinking or women's studies. Designed to teach critical thinking and communication skills, using topics of sex and gender as subject matter.

37. Math Confidence (2). (See N Sci 37.) *CR/NC* grading only.

50T. Studies in Literature (4). (See Engl 50T section.) *Women in Novels section.*

55T. Topics in Women's Studies (1–4; max total 12). Topics of current interest in the Women's Movement, covering a wide variety of issues. (See *Schedule of Courses* for specific topics.)

101. Women in History (3). (See Hist 101.) General Education BREADTH, Division 9.

105. Education and Sex Role Stereotypes (3). Designed to meet the needs of parents, teachers, counselors, administrators. How sex role stereotypes affect the educational system, pre-K through higher education.

108. Rape (1). An inquiry into the phenomenon of rape, myths about rape and rapists, treatment of rape victims, discussion of physical and psychological preparation for possibility of attack. Lecture, film, paper, speakers. An all day workshop held on two consecutive Saturdays. *CR/NC* grading only.

109. Incest (1). An exploration of the victim, the victimizer, and the family dynamics of incest, as well as the psychological and sociological implications of the family secret. An all day workshop held on two consecutive Saturdays. *CR/NC* grading only.

112. Assertive Training (1). Women's special needs in becoming assertive; blocks preventing assertion and methods of getting around them. An all day workshop held on two consecutive Saturdays. *CR/NC* grading only.

114. Marriage and the Family in the 1990s (1). A re-examination of the concept of traditional marriage and the family, and emerging concepts of the 1990s. Contemporary complaints against traditional family roles, proposed alternatives, and their implications. Films, speakers. An all day workshop held on two consecutive Saturdays. *CR/NC* grading only.

116. Domestic Violence (1). An historical and cultural overview of the battered and battering spouse syndromes; the marriage contract as a license to abuse; the status of remedial legislation; and, the effect of parental battering on children. An all day workshop held on two consecutive Saturdays. *CR/NC* grading only.

118. Women and Aging (1). An exploration into the myths and realities of the aging process, with a focus on women. The class will confront the issues of aging in order to stimulate constructive change and positive alternatives for women. An all day workshop held on two consecutive Saturdays.

124. Feminist Art (3; max total 6). (See Art 104.)

126. Women and Violence: Public Policy and the Law (3). (Same as Crim 126.) Historical and contemporary issues in public policy responses to violence against women. Gender bias in the legal system and policing violence against women. Theory and research on problems in government policy and enforcement of the law.

127. Female Sexuality (3). (See H S 126.)

130. Women's Health (3). (See H S 130.)

131. Sociology of Sex Roles (3). (See Soc 131.) General Education BREADTH, Division 9.

132. Women and Work (3). (See Soc 132.)

135. Women in Other Cultures (3). Examines the religious, economic, and social roles of women in the world, including their current status in at least four of the following areas: China, Southeast Asia, India, Africa, Middle East, South America. General Education BREADTH, Division 9.

137. African-American Women (3). (See Af Am 137.) General Education CAPSTONE Cluster.

145. Women in the Theatre (3). (See Drama 145.)

150T. Topics in Women's Studies (1–4; max total 12). Topics of current interest in the Women's Movement, covering a wide variety of issues. *CR/NC* grading only. (See *Schedule of Courses* for specific topics.)

152. The Chicano Family (3). (See CLS 152.) General Education CAPSTONE Cluster.

155. Career Life Planning (3). An exploration of contemporary career planning models and their practical application in the work world. Identification of individual needs, values and capabilities as they apply to making career choices and becoming upwardly mobile.

160. Feminist Issues in Counseling (3). Prerequisite: W S 10 or permission of instructor. Evaluates counseling theories; individual and group counseling techniques; examines ethical issues and power structure in therapeutic settings; surveys community resources; and explores innovative and feminist perspectives concerning the effective treatment of women.

161T. Peer Education (1; max total 4). Topics: sexual assault, sexual harassment, alcohol and drug abuse, or eating disorders. Students learn curriculum content, develop teaching and group facilitation skills, and make presentations to campus peer groups. Permission of instructor. May be taken up to four times if no topic repeated. *CR/NC* grading only.

162. Community Service (1–3). Prerequisite: 9 hours of W S courses and permission of instructor and sponsoring agency. Individually-planned experience which relates student's classroom studies to practical experience in a women's community service agency. *CR/NC* grading only. (Minimum of 3 field hours per unit.)

163. Consciousness Raising: Group Leader (1; max total 2). Prerequisite: W S 10 and permission of instructor. Students learn skills in facilitating group discussion and review content of W S 10 course; students lead a consciousness raising discussion group of students currently taking W S 10. *CR/NC* grading only. (2 lab hours)

165. Women and the Media (3). Historical perspectives, contemporary issues, and future alternatives for women as mass media professionals and for consumers of sexist media messages.

168T. Women and Literature (4). (See Engl 168T.)

170. Women: Culture and Biology (3). (See Anth 170.) General Education CAPSTONE Cluster.

172. Psychology of Women (3). (See Psych 172.)

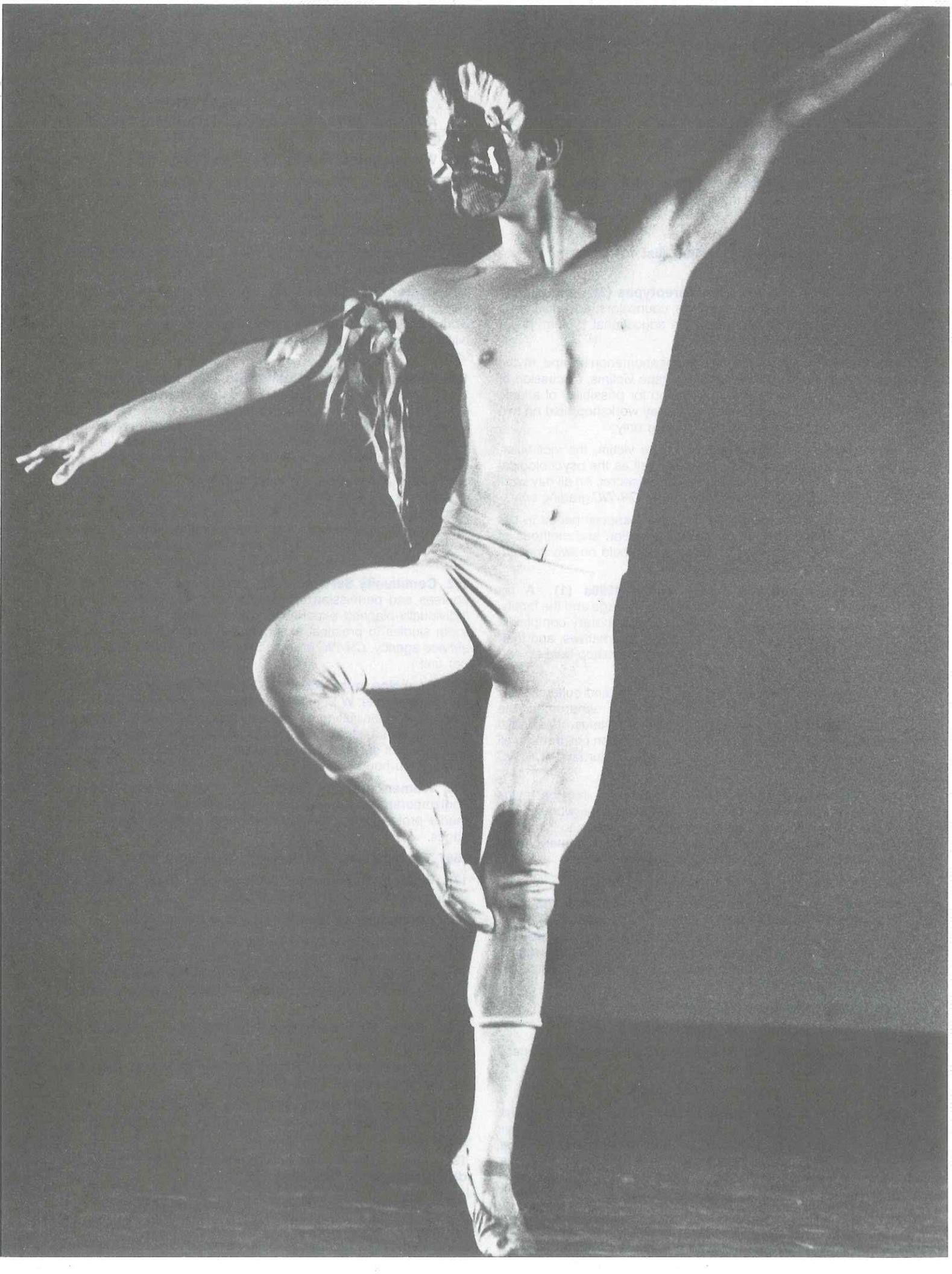
175. Seminar in Women's Studies (3). Primarily for Women's Studies minors. Prerequisite: 15 units in Women's Studies (including W S 10). A synthesis of objective and subjective experience in Women's Studies. In-depth research project required.

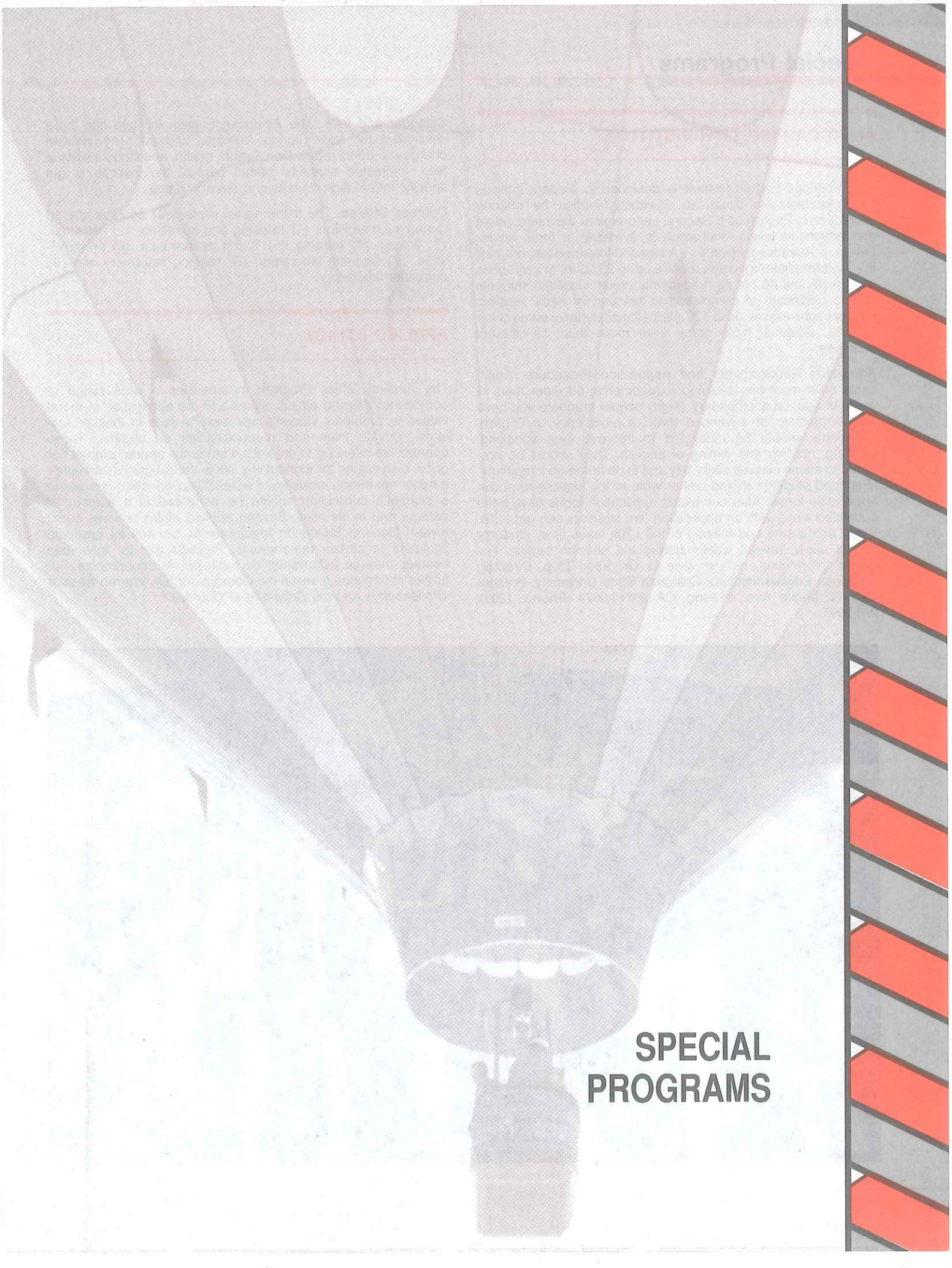
176T. Genre Film: Form and Function (1–4; max total 8). (See Engl 176T.)

179T. Studies in United States History (1–3; max total 6 if no topic repeated). (See Hist 179T.)

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

194T. Seminar in Women and Literature (4; repeatable with different topics). (See Engl 194T.)





SPECIAL PROGRAMS

AMERICAN ENGLISH INSTITUTE

The American English Institute is designed to prepare international students for American university studies by offering instruction in English as a Second Language at the intermediate and advanced levels. Instruction is available at three levels: Level I — Advanced, Level II — Advanced Intermediate, or Level III — Intermediate. Students receive up to 23 hours of instruction each week but do not earn academic credit. Qualified students earn a certificate of completion at the end of each session. During each session, up to 120 international students enroll at the institute. Students have come from more than 25 different countries.

Admission Requirements and Application Procedure. Applicants must meet the following requirements: be older than 16 years of age, be a secondary (high) school graduate and have an intermediate or advanced level of proficiency in English. Applicants should be motivated to improve their speaking, listening, reading and writing of English. They should be prepared to attend classes every day and to do homework regularly. Interested students should call or write to the institute to obtain application forms. After completed application forms have been submitted along with an application fee, students can get I-20s. Since processing and mailing of the I-20s takes time, students should apply several weeks before the session begins. For further information, call or write to Dr. Ellen Lipp, Director, American English Institute, California State University, Fresno; 5241 N. Maple Ave., Fresno, CA 93740-0074. Phone: (209) 278-2097.

Calendar and fees. The American English Institute has three sessions each year: spring, summer and fall. The institute charges students registration, tuition, health, and student service fees. Interested students should contact the institute to get specific information on fees and session dates.

Courses Offered. The following list represents courses offered during each session: (1) listening and speaking, (2) grammar, (3) writing, (4) reading, (5) TOEFL preparation, (6) pronunciation, (7) listening laboratory, (8) reading laboratory and (9) computer laboratory.

APPLIED ETHICS

The Applied Ethics Program incorporates a wide range of courses addressing ethical issues and the application of moral values to problems students are likely to face in their professions, private lives and responsibilities as citizens. These courses are intended to enhance a student's appreciation of her or his own values throughout life. While the program has neither a major nor minor, inclusion of several applied ethics courses in a student's curriculum should be beneficial in a number of careers and in life itself. Several applied ethics courses count toward General Education requirements, as well as graduate seminars in certain departments. Prerequisites for advanced courses may be established by participating departments. For further information, consult the Coordinator, Dr. Warren Kessler (Philosophy) and the *Schedule of Courses*.



COURSES

Applied Ethics (A Eth)

100. Contemporary Conflicts of Morals (3). (See Phil 120.) General Education BREADTH, Division 6.

101. Introduction to Professional Ethics (3). (See Phil 122.)

102A.* Economics, Ethics and Civilization (3). (See B A 101.)

102B. Economics, Ethics and Civilization (3). Theories of ethics and their relevance to civilization, a study of the economic and social philosophy of Karl Marx, humanist, scientist and revolutionary, as well as a comparison of the Marxism of the USSR with the philosophy of Mao Tsetung and the People's Republic of China.

104. Politics and Christianity (3). (See Pl Si 112.) General Education CAPSTONE Cluster.

106T. Topics in Applied Ethics (1–3). Selected topics involving applied ethics covering a range of career and life issues. Usually requires a previous course in applied ethics or special background.

190. Independent Study (1–3; max see reference). See *Academic Placement — Independent Study.* Approved for *SP* grading.

192. Directed Reading (1–3; max total 6). Prerequisite: permission of instructor. Supervised readings in a selected applied ethics field.

194. Seminar in Applied Ethics (3). Prerequisite: one previous course in applied ethics or special background. Intensive investigation of issues in applied ethics, normally requiring substantial student participation and discussion.

200. Ethics in Psychology (2). (See Psych 231.)

201. International Relations and Political Theory (3). (See Pl Si 210.)

202. Ethics and Public Administration (3). (See GPA 250.)

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* A Eth 102A may be substituted for B A 101.

ASIAN STUDIES

CSU, Fresno offers courses in many disciplines which are concerned with South, Southeast and East Asia. Although there is no degree program in Asian Studies at this time, an interdisciplinary undergraduate minor is available for students who desire a knowledge of Asia as a complement to their chosen academic discipline or profession. For further information and for aid in planning such a course of study, consult the Coordinator of Asian Studies, S. Kapoor, Ph.D., (209) 278-2013, (209) 278-3992, or any member of the Asian Studies Committee.

Minor

A minor in Asian Studies consists of 21 units, including a minimum of 9 upper-division units. Specific requirements:

1. 6–9 units in one of the areas subsumed under Section I or II.
2. A total of four courses, two (at least 6 units) from Section I and two (at least 6 units) from Section II, but none in the area chosen in Requirement 1.
3. Up to 3 units of electives from Sections I, II or III.

Independent Study (190) courses in any department may be applied toward the minor as long as they cover some aspect of Asian Studies and are approved by the coordinator. Unspecified topics courses and seminar courses listed below must cover some aspect of Asia to be counted toward the minor.

COURSES

SECTION I. HUMANITIES

Ling 110 Indic Culture and Tradition (3)

Language

Chinese	1A–1B	Elementary Chinese (3–3)
	2A–2B	Intermediate Chinese (3–3)
Japanese	1A–1B	Elementary Japanese (3–3)
	2A–2B	Intermediate Japanese (3–3)
Sanskrit	10A–B	Sanskrit (3–3)

Philosophy and Religion

Philosophy	136	Buddhism (3)
	137	Hinduism (3)
	138	Chinese Thought (3)
	172T	Seminar in Religious Issues (1–4)

SECTION II. SOCIAL SCIENCES

Anthropology	123	Peoples and Cultures of Southeast Asia (3)
	124	Peoples and Cultures of East Asia (3)
	129T	Topics in Area Surveys (1–3)
	155	Folk Medicine (3)
	159T	Topics in Ideology (1–3)
	181	Cultures and Foods of East Asia (3)
	186	Tradition and Change in China and Japan (3)
Economics	114	Economic Development of Poor Nations (3)
	182	Political Economy of China (3)
	188T	Special Topics (1–3, max total 6)
Geography	177T	Asian Regions (3, max total 9, if no area repeated)
History	6	East Asian Civilization (3)
	191A	Modern Far East, 1843–1949 (3)
	191B	Modern Far East, 1949–Present (3)
	199T	Studies in Far Eastern History (1–3; max total 6, if no topic repeated)
Social Work	122T	Gandhi and Nonviolence (3)
Political Science	183	Comparative Administration (3)

SECTION III. COURSES PARTIALLY RELATED TO ASIA

Agricultural Economics	140	International Agriculture (3)
	147	Seminar in International Agriculture (3)

BASIC WRITTEN ENGLISH

The following minicourses are designed to help students improve their writing skills. Each course offers intensive work in a specific area. Students may take one or all or any combination of these 1-unit courses. These courses may be taken prior to, concurrently with, or after Engl 1 or A. Classes are taught by members of the English and Linguistics departments.

Basic Written English (B W E)

4A. Spelling and Word Formation (1). Developing awareness of the systematic nature of English spelling in relation to the sound system and rules for word formation in the language. Mastery of the system rather than word memorization is emphasized.

4B. Vocabulary Building (1). Acquiring greater sensitivity to the literal and implied meanings of words, developing an awareness of the processes of word formation in English, and expanding the active vocabulary.

4C. Sentence Structure (1). Developing skill in writing clear, mature sentences. The focus of the course is on structure — that is, on the alternative ways of phrasing the same idea and the consequences of choosing one alternative and not another. Sentence and phrase expansion, reduction, combination and rearrangement are emphasized, not traditional grammar.

4D. Punctuation (1). Learning to use punctuation marks so that readers readily understand the writer's ideas. Particular attention to the use of commas, semicolons, apostrophes and dashes. A minimum number of unvarying rules are emphasized.

4E. Paragraph and Essay Organization (1). Developing skills in identifying the subtopics which make up the central idea of a paragraph or essay, in expanding and supporting ideas, and in arranging them so that the writer's purpose is carried out as effectively as possible.

CHILD DEVELOPMENT — MAJOR

The university offers an interdisciplinary major leading to the Bachelor of Science degree in child development. The major is appropriate for students interested in vocational opportunities based on children. It may lead to employment in the areas of preschool, child center, private nursery, early childhood and elementary teaching, special programs for disadvantaged children, special education, adult education programs and other child-related vocations.

The program includes a behavioral science base from psychology, sociology, home economics, and courses in communicative disorders and speech communications. Faculty advisers for the child development major are located in the Department of Family Studies and Home Economics.

The major consists of a core of 11 courses listed below, plus 15 units of approved electives. *Note:* CFS 39, Psych 10 and Soc 1 are prerequisites to some of these courses. Please consult catalog.

	Units
1. Major requirements	48
a. Required Courses	(33)
CFS 37, 138, 139	(9)
CFS 131 or Soc 165	(3)
CFS 134 or Psych 178	(3)
A S 172, 174	(6)
C D 80	(3)
Psych 101, 136	(6)
Spch 162	(3)
b. Approved electives: (see adviser to obtain an approved list of elective courses)	(15)
2. General Education requirements	51
3. Electives and remaining degree requirements (see *Degree Requirements*); may be used toward a minor	25
Total	124

Notes:

1. Students seeking teaching credentials should see a child development adviser for program planning before enrolling in any classes in the major.
2. Under the restrictions of the major, students may make approved adaptations in their programs to fulfill specific needs and career objectives in consultation with their faculty adviser.
3. *CR/NC* grading is not permitted in the major.
4. No course used to satisfy General Education CAPSTONE requirements may be used to satisfy child development major requirements.

COOPERATIVE EDUCATION

CSU, Fresno's Cooperative Education program (Co-op) incorporates productive, major-related work experience into a student's academic studies. Cooperative Education students are given the opportunity to combine classroom theory with "on-the-job training" to work with professionals in their particular field of study and to test their career choice.

In addition to augmenting their marketable knowledge, students receive competitive wages, develop maturity and may earn academic credits from cooperating departments. The program is available to all academic majors upon completion of the freshman year. There are two options for participation:

1. Under the *Alternating Plan,* students work one semester on a full-time basis and then study one semester on a full-time basis.
2. Under the *Parallel Plan,* part-time work is found that closely relates to a student's current classes and career interests.

Work, related to the student's academic and career choices, is identified through the combined efforts of the Cooperative Education Section of the Career Development Center and the various academic departments. Placement arrangements are negotiated with local cooperating employers in the San Joaquin Valley, as well as throughout California and the United States. Co-op students have been placed in city, state and federal governmental agencies; agriculture; business; and all facets of private industry.

To be eligible for Co-op, you must be currently registered at CSU, Fresno, have at least a 2.0 grade point average, and be a sophomore, junior, senior or graduate student. For further information, telephone the Career Development and Employ-



Vice Chancellor Kulandaiswamy (center) of Anna University, India, shown with President Harold H. Haak (right) and G. "Vishu" Visweswaran, chair, Academic Senate, on the occasion of his visit to formalize cooperative relationships with CSU, Fresno.

ment Services at 278-2703 or visit the center in Joyal Administration Building, Room 256.

The following courses offer field experiences that may qualify as cooperative education. Check with the academic department for enrollment requirements:

A S 115F	Field Work in Special Education
A S 237A	Field Work in Elementary School Counseling
A S 237B	Field Work in Secondary School Counseling
A S 238	Field Work in Professional Services Counseling
Ag Ec 194	Agribusiness Internship
A Sci 194	Agricultural Internship
C E 193	Internship in Civil Engineering
C Sci 194	Cooperative Education
ECE 193	Electrical and Computer Engineering Cooperative Internship
Engl 185	English Internship Seminar
Engl 186	Internship in English
Enol 194	Enology Internship
H Ec 193	Cooperative Education
FScN 193	Supervised Work Experience
H S 185F	Field Work in Health
I E 193	Industrial Engineering Cooperative Internship
I T 194	Cooperative Education in Industrial Technology
M E 193	Mechanical Engineering Cooperative Internship
Ph Th 180T	Topics in Physical Therapy
Plant 194	Agricultural Internship
Pl Si 187	Internship in Public Administration
S E 193	Internship in Surveying Engineering
T Ed 122F	Field Work in Outdoor Education

MASS COMMUNICATION GRADUATE PROGRAM

The Master of Arts in Mass Communication is an interdisciplinary degree program jointly offered by the journalism and telecommunications faculties of the university. The program has been developed to prepare students for professional roles in the various mass communication industries, as teachers in the mass communication disciplines, or as candidates for advanced graduate study and research.

The Division of Graduate Studies and Research provides administrative coordination for graduate interdisciplinary programs and courses.

The program is supervised by a joint committee of representatives from the Department of Telecommunications and the Department of Journalism. For more information, contact **Philip J. Lane, coordinator, at (209) 278-2628.**

Master of Arts Degree Requirements

The Master of Arts in Mass Communication degree program assumes that the student has an undergraduate major in a directly related field, such as radio, television, film, journalism, etc.

(See also *Admission to Graduate Standing, Advancement to Candidacy, Program Requirements,* and *Criteria for Thesis and Project.*)

Under the direction of an advisory committee, each student prepares and submits an individually designed course of study within the following framework:

	Units
Required core courses: M Com 200, 201, 202	9
Selected courses in major interest area	9–12
Approved electives in cognate areas (e.g., psychology, political science, sociology)	3–6
Thesis	6
Total (at least 21 units in 200-series)	30

COURSES

The following graduate courses in mass communication may be used on master's degree programs.

Mass Communication (M Com)

200. Historical and Critical Research Methods (3). (Core) A seminar in historical and critical research methods, including cultural studies and legal research, and their underlying philosophical bases. Papers required.

201. Quantitative Research Methods (3). (Core) A survey of philosophies of modern research and of quantitative-empirical research methods used in studies of mass communications phenomena, including experiment, field survey and content analysis. Papers required.

202. Mass Communication Theories (3). (Core) A study of the nature and structure of theory and of theoretical literature in mass communications and related fields. Papers required.

204T. Seminar in Journalism (3; max total 9). Seminar in a print media topic: government information policy, news media and urban affairs, social responsibility in public relations, magazine influence in America.

205T. Seminar in Radio-Television (3; max total 9). Seminar in an electronic media topic: current regulatory issues, mass media and social influence, comparative and international broadcasting, film as social comment, issues in media management.

230. Criticism of Broadcasting and Film (3). Development of ethical, artistic and critical standards for broadcast and motion picture evaluation. Principles of criticism are traced from an historical to a contemporary context. Research papers and reports required.

290. Independent Study (1–3; max total 6). See *Academic Placement — Independent Study.* Approved for *SP* grading.

299. Thesis (6). Prerequisite: See *Criteria for Thesis and Project.* Preparation, completion and submission of an acceptable thesis for the master's degree. Approved for *SP* grading.

SPECIAL MAJOR — MASTER'S DEGREE

The special major for the Master of Arts degree is available to qualified graduate students when there is a need for advanced study in subject matter that is interdisciplinary and that is not available through existing graduate programs. In such instances, proposals for a special major that may combine cohesive, interrelated coursework from two or more departments, must be submitted for the approval of the dean, Division of Graduate Studies and Research. Proposals that could be accommodated by an existing master's degree or option at CSU, Fresno are not approved.

General Eligibility

The student must demonstrate a superior undergraduate preparation for advanced studies and research appropriate to the departments involved in the proposed special major. The student must meet the minimum criteria for admission to conditionally classified standing in the departments concerned.

Degree Requirements

The basic requirements for the special major are the same as for all other master's degrees. At least 50 percent of the program must be in courses designated for graduate study, that is, in graduate-level 200 series courses. The proposed program must truly reflect the requirements of scholarly creativity and research appropriate to the graduate level and must exhibit overall coherence in a particular, recognized field of study. The proposed program must lead to the mastery of specific knowledge or skills in an area of advanced studies for which adequate faculty, library and laboratory resources are present. Although the special major provides an opportunity for exceptional students to engage in a program outside the framework of existing majors, all normal graduation requirements and standards will be applied. Students pursuing a special major master's degree are required to write a thesis to fulfill the requirement for a culminating experience. For more detailed information concerning the application process, the procedures for constituting a committee and program for the special major, consult the Office of the Division of Graduate Studies and Research.

INTERNATIONAL PROGRAMS

The university offers two programs under this heading, a campus program and an overseas program. The campus program is designed for students whose native language is not English and for those whose education has been in a language other than English. All such students are required to participate in post-admission English language testing. As a result of such testing, any student may be required to register for certain courses.

Campus Program

The International Program (Campus) provides courses intended to help international students gain adequate skill in the use of the English language and sufficient familiarity with American customs and tradition to obtain maximum benefit from their experience at an American university. The following program, taught through the Linguistics Department, is required of all entering international students, unless excused from part or all of it by the International Studies Courses (ISC) Petitions Committee on the advice of the persons concerned with the instruction and administration of the program. This decision is based on a consideration of test scores and other data supplied by the student with his/her application. (See *International Student Services and Programs.*) After arrival on campus, examinations and an interview may lead to the student's being excused from certain courses.

First Semester Program. Most students are required to enroll in E F L 10 and I S C 93 in the first semester of residence. In addition, students with less skill in English may be required to take E F L 2R and/or E F L 21. With permission of their international counselor, students may enroll in other regular courses.

Other Undergraduate Courses. E F L 110W is often required of transfer students who have completed English 1 or its equivalent and 56 units of coursework.

Courses Taken in Graduate Standing. An entering graduate student whose previous education has been in a language other than English is held to the same standards of English proficiency as are undergraduate students and may be required to enroll in the following undergraduate courses when considered necessary by the student's advisers.

COURSES

English as a Foreign Language (E F L)

2R. Grammar and Reading Comprehension (3). Review of intermediate and advanced grammatical patterns. Reading comprehension and vocabulary building. *CR/NC* grading only; not applicable toward baccalaureate degree requirements.

10. English Composition for Foreign Students (3). Practice in writing paragraphs, short essays and other types of writing. Brief review of certain grammar problems and punctuation.

10L. Writing Skills Lab (1). Laboratory for students who need individualized writing assignments.

21. Advanced Oral Practice in American English (3). Advanced work on stress, rhythm and intonation. Practice in listening comprehension. Speech styles: formal vs. informal. Speech organization and delivery.

110W. Advanced Composition for Foreign Students (3). Prerequisite: Engl 1. Review of selected points of English usage. Conventions of writing formal research reports. Writing of short essays. Practice in paraphrasing and summarizing. Writing complex sentences in concise form. Meets upper-division writing skills requirement for graduation.

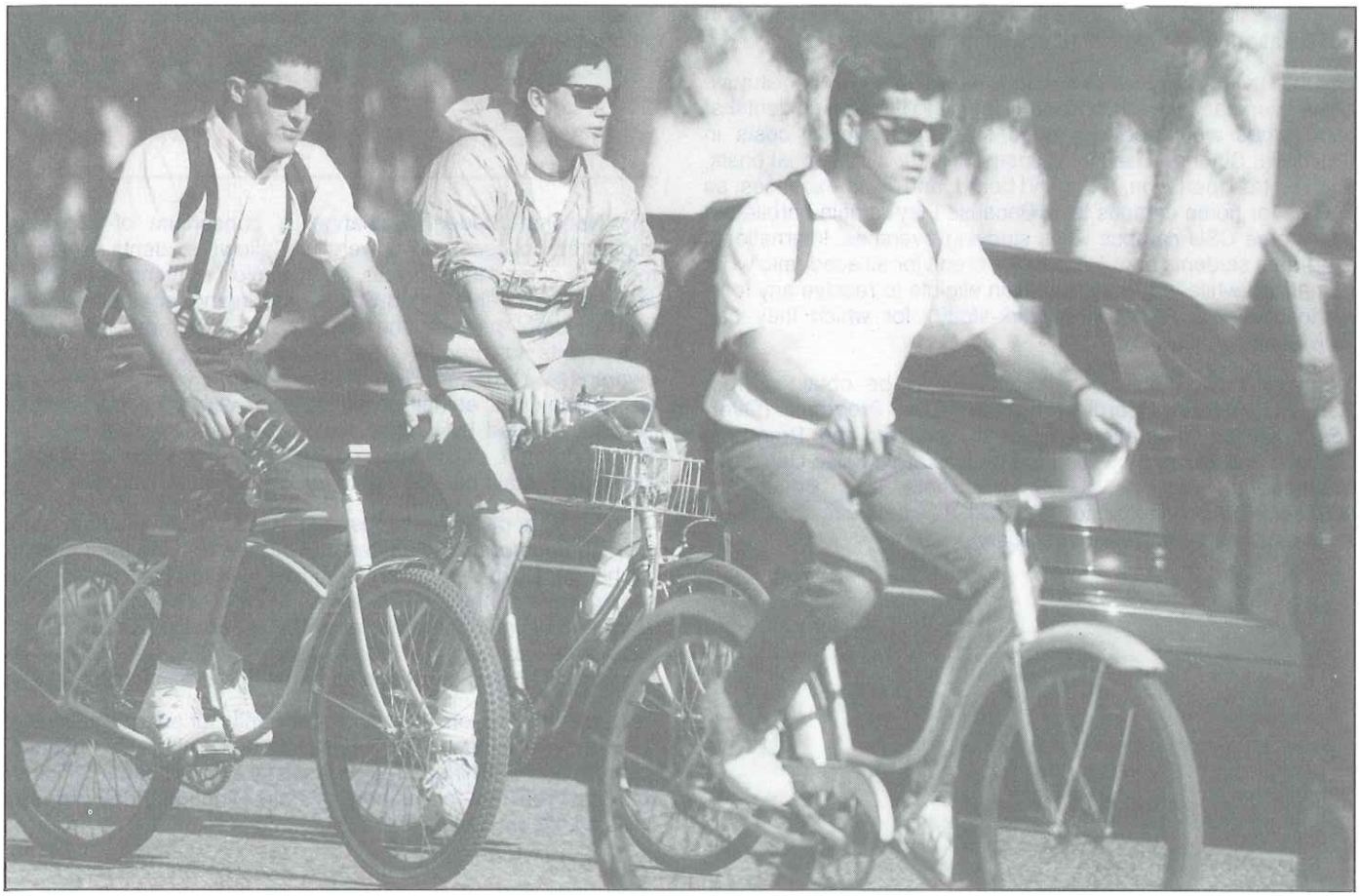
110L. Writing Skills Lab (1). Laboratory for students who need individualized writing assignments.

International Studies Course (I S C)

93. Contemporary American Society (1). Introduction to contemporary American society to familiarize the student with political and social issues and ideological conflicts. (2 seminar hours)

INTERNATIONAL PROGRAM (Overseas)

Now in its 26th year of continuous operation, the California State University (CSU) International Programs offers students the opportunity to continue their studies overseas for a full academic year while they remain enrolled at their home CSU campus. The International Programs' primary purposes are to enable selected students to gain a firsthand understanding of other areas of the world and to advance their knowledge and skills within specific academic disciplines in pursuit of established degree objectives. Since its inception, the International Programs has enrolled nearly 9,500 CSU students.



A wide variety of academic majors may be accommodated by the 34 foreign universities cooperating with the International Programs in 16 countries around the globe. The affiliated institutions are: the University of Queensland (Australia); the University of Sao Paulo (Brazil); the universities of the Province of Quebec (Canada); the University of Copenhagen (through Denmark's International Student Committee's Study Division); the University of Provence (France); the Universities of Heidelberg and Tübingen (Germany); the Hebrew University of Jerusalem (Israel); the University of Florence (Italy); Waseda University (Japan); the Iberoamericana University (Mexico); Massey University and Lincoln University College (New Zealand); the Catholic University of Lima (Peru); National Chengchi University (Republic of China/Taiwan); the Universities of Granada and Madrid (Spain); University of Uppsala (Sweden); Bradford, Bristol, Sheffield and Swansea Universities and Kingston Polytechnic (the United Kingdom). Information on academic course offerings available at these locations may be found in the International Programs Bulletin from the International Programs representative on campus.

Eligibility for application is limited to those students who will have upper-division or graduate standing at a CSU campus by the time of departure, who possess a cumulative grade point average of 2.75 or 3.0, depending on the program, for all college level work completed at the time of application, and who have completed required language or other preparatory study where applicable. Selection is competitive and is based on home campus recommendations and the applicant's academic record. Final selection is made by the Office of International Programs in consultation with a statewide selection committee.

The International Programs supports all tuition and administrative costs overseas for each of its participants to the same extent that such funds would be expended to support similar costs in California. Students assume responsibility for all personal costs, such as transportation, room and board, and living expenses, as well as for home campus fees. Because they remain enrolled at their home CSU campus while studying overseas, International Programs students earn full resident credit for all academic work completed while abroad and remain eligible to receive any form of financial aid (other than work-study) for which they can individually qualify.

Information and application materials may be obtained from Sonya L. Hildreth, Coordinator, International Programs (Overseas) at the International Student Services and Programs Office, Joyal 211 or by writing to The California State University International Programs, 400 Golden Shore, Long Beach, CA 90802-4275. Applications for the 1991–92 academic year overseas must be submitted by February 1, 1991.

COURSES

California State University, Fresno students under The California State University International Programs register concurrently on campus and at the host institution abroad, with credit assigned in terms of CSU, Fresno courses. Undergraduate students who find appropriate study opportunities at the host institution but no local counterpart course may use Independent Study (190), and International Study Abroad (92) or (192). Graduate students may use Independent Study (290) and International Study (292).

International Studies — Abroad (I S A)

92. Projects in Study Abroad: (Subject) (Units variable; max total 18). Open only to students in The California State University International Programs. Study undertaken in a university abroad under the auspices of The California State University.

192. Projects in Study Abroad: (Subject) (Units variable; max total 18). Open only to students in The California State University International Programs. Study undertaken in a university abroad under the auspices of The California State University.

292. Projects in Study Abroad: (Subject) (Units variable; max total 18). One- to three-unit registrations. Prerequisite: admission to master's degree program; written plan approved by the instructor, department chair, and dean of the Division of Graduate Studies and Research. May require one or more papers and oral or written examination on the student's return before the recording of the final grade.

NATIONAL STUDENT EXCHANGE PROGRAM

The National Student Exchange, a consortium of 83 state-supported colleges and universities, allows students to attend, for up to one academic year, an institution of higher learning in another area of the United States. In bringing together students from different parts of the country, the program encourages participants to broaden their academic, social and cultural awareness. Through a simplified admissions process, students are able to enroll at their host institutions with the same financial benefits enjoyed by in-state residents. Coursework completed will be treated as transfer coursework, but students will be allowed to retain catalog rights for CSU, Fresno degrees.

To qualify, a participant must (1) be currently enrolled as a full-time undergraduate student at CSUF and in the term prior to exchange; (2) be a sophomore, junior and in some cases have senior status during the exchange; (3) have a minimum 2.5 GPA at the end of Fall 1990 semester and at the completion of the term prior to exchange; (4) be in good standing at CSUF. The program is closed to foreign students and postbaccalaureates.

For more information about this opportunity for educational travel and study in a new environment, contact Sabina A. Jacques, Coordinator, or Shirlene Major, Assistant Coordinator, Office of the Vice President for Academic Affairs, Thomas Administration Building, Room 110 (278-2636).

RUSSIAN AREA STUDIES

CSU, Fresno offers an interdisciplinary minor in Russian Area Studies. This minor may complement a number of academic majors and will prove helpful to students seeking employment with public or private organizations dealing extensively with the Soviet Union.

Minor

The Russian Area Studies minor consists of 20 units, of which at least 11 must be in the Russian language, and at least 6 from the departments of geography, history and political science.

Students with a major in Russian language and literature are given credit for Russian 1A–B, and must take 3 additional units of Russian language and literature beyond the requirements for the Russian major, plus 9 units from the remaining four sections below (Russian and Soviet Culture, Russian and Soviet History, Soviet Geography, Soviet Politics), including at least 6 units selected from the departments of geography, history and political science.

Likewise, students with a major in geography, history or political science must choose their units within these areas so that they are in addition to, and not duplicates of, the course requirements for their major.

Courses taken to meet the CAPSTONE requirement of General Education may also be used to fulfill the requirements for the Russian Area Studies minor.

CSUF provided the foundation, learning and intellectual framework for a lifetime of knowledge accumulation. I am deeply indebted to the faculty and to the institution for my time spent there.

Paul H. O'Neill
Alumnus from Pittsburgh
Chairman and CEO, ALCOA

COURSES

Russian Language

Russian 1A	Elementary Russian (4)
Russian 1B	Elementary Russian (4)
Russian 2A–B	Intermediate Russian (4–4)
Russian 101	Composition and Conversation (3)
Russian 118A–B	Twentieth Century Literature (3–3)
Russian 190	Independent Study (1–3)

Russian Literature

Russian 110	Landmarks in Russian Literature (3)
Russian 148	Masterpieces of Russian Literature (3)
Russian 190	Independent Study (1–3)

Russian and Soviet Culture

Russian 103T	Topics in Russian Culture (3)
Russian 127T	Soviet Russian Topics (3)
History 144	Russian Culture (3)

Russian and Soviet History

History 142	Tsarist Russia (3)
History 143	The Soviet Union (3)

Soviet Geography

Geography 176	Geography of the U.S.S.R. (3)

Soviet Politics

Political Science 125	Soviet Foreign Policy (3)
Political Science 141	Soviet Politics (3)



DIVISION OF GRADUATE STUDIES AND RESEARCH

Graduate Studies and Research

Division of Graduate Studies and Research
Vivian A. Vidoli, Dean
David A. Ross, Associate Dean
Thomas Administration Building, Room 132
(209) 278-2448

The Division of Graduate Studies and Research embraces all graduate programs and activities in the university, including programs leading to the master of arts degree in 20 fields, the master of science degree in 18 fields, the master of business administration, the master of city and regional planning, the master of public administration, and the master of social work.

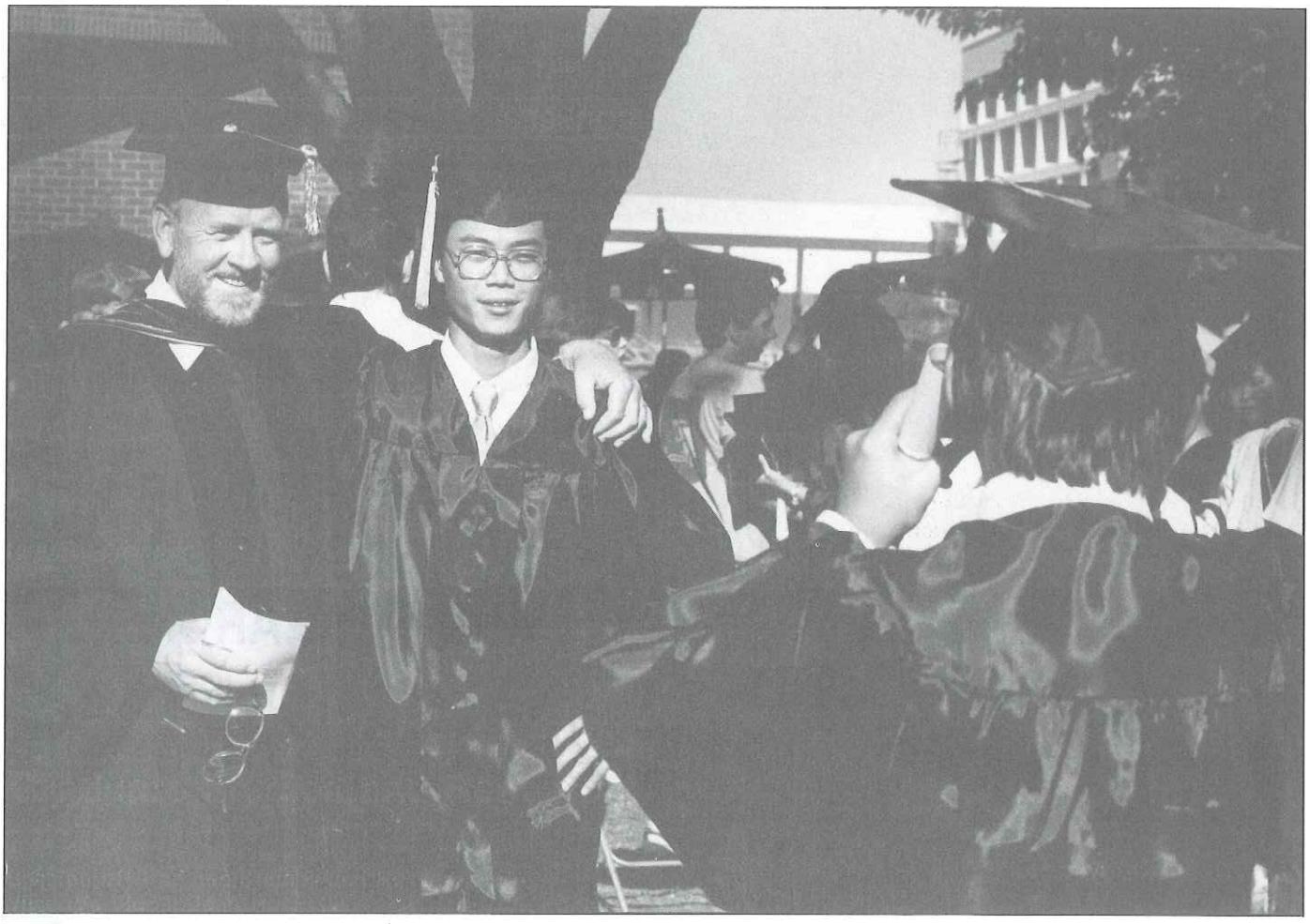
Graduate degree curricula are designed both as the first graduate degree for students contemplating doctoral study and as terminal degrees for persons engaged in business administration, public school teaching including community college, social work, employment in government agencies and other fields in which the master's degree is ordinarily the highest degree earned.

The master's degree program at CSU, Fresno is administered through the Division of Graduate Studies and Research and is under the general supervision of the Dean, Division of Graduate Studies and Research, who is guided by the policy recommendations of the University Graduate Committee.

Graduate Degrees Offered and Authorized Options

Accountancy, M.S.*
  Financial Accounting, Taxation
Agricultural Business, M.S.
Agriculture, M.S.*
  Agricultural Chemistry, Animal Science, Food Science and Nutrition
Art, M.A.
Biology, M.A.
Business, M.B.A., M.S.
Chemistry, M.S.
City and Regional Planning, M.C.R.P.
Civil Engineering, M.S.
Communicative Disorders, M.A.*
  Audiology, Education of the Deaf, Speech Pathology

* In these programs, a student may *not* earn a degree without also declaring an option.



Counseling, M.S.*
  Marriage, Family and Child Counseling,
    Career Development Counseling
Criminology, M.S.
  Corrections, Law Enforcement
Education, M.A.*
  Administration and Supervision, Curriculum and Instruction, Early Childhood Education, Reading, School Counseling
English, M.A.
  Composition
  Creative Writing
  Literature
Geography, M.A.
Geology, M.S.
Health Science, M.S.*
  Environmental Health, Health Education, Health Services Administration
History, M.A.
Home Economics, M.S.*
  Home Economics Education
Industrial Arts, M.A.
International Relations, M.A.
Linguistics, M.A.
  English as a Second Language, French, German
Marine Sciences, M.S.
Mass Communication, M.A.*
Mathematics, M.A., M.S.
Music, M.A.*
  Music Education, Music History, Performance, Theory and Composition
Nursing, M.S.*
  Clinical Specialization, Nursing Administration, Nursing Education, Primary Care/Nurse Practitioner
Physical Education, M.A.
  Exercise Science
Physics, M.A., M.S.
Plant Science, M.S.*
  Crop Science, Plant Protection, Soils/Irrigation
Psychology, M.A., M.S.
Public Administration, M.P.A.
Rehabilitation Counseling, M.S.
Social Work, M.S.W.
Spanish, M.A.
Special Education, M.A.
Special Major, M.A.
Speech, M.A.*
  Theatre Arts, Speech Communication

Types of Graduate Curricula

Master of Arts degree (M.A.) curricula are offered in art, biology, communicative disorders, education, English, geography, history, industrial arts, international relations, linguistics, mass communication, mathematics, music, physical education, physics, psychology, Spanish, special education, special major and speech. These curricula are designed to improve professional competence in educational service; to develop ability for continued formal or self-directed study in a field of specialization; and to afford an opportunity to broaden cultural background, develop personal and social responsibility, and prepare for community leadership.

Master of Science degree (M.S.) curricula are offered in accountancy, agricultural business, agriculture, business, chemistry, civil engineering, counseling, criminology, geology, health science, home economics, marine sciences, mathematics, nursing, physics, plant science and psychology. These curricula are designed to improve competence in occupational fields.

Professional master's degree curricula. The Master of Business Administration, the Master of Public Administration, the Master of Science in Rehabilitation Counseling, the Master of Social Work, and the Master of City and Regional Planning are professional two-year degrees designed to provide a high level of competence and preparation for leadership in these respective fields.

Financial Aid for Graduate Students

Opportunities for financial assistance, loans, fellowships and scholarships are included under *Financial Aid* in this catalog.

Teaching and Graduate Assistantships

A number of teaching and graduate assistantships are available to graduate students who are enrolled in a master's degree program and whose previous records show outstanding achievement in academic work, outstanding subject matter competence in the major field, and the special qualities necessary to the duties assigned. An assistant works under the direction of a regular faculty member, assists in such functions as the supervision of laboratories or other small groups, the evaluation of student work, the preparation of course materials, or the conduct of authorized research. An assistant receives a stipend ranging from $1,489 to $9,715 for the academic year. For information write to the chair of your major department.

Definition of Full-Time Student

Depending on the use of the term, there are several definitions of full time. *For the purposes of reporting enrollments,* students taking 12 or more units are considered full time and students taking less than 12 units are considered part time.

For purposes of financial aid (loans, veterans assistance, etc.), a full-time student takes 12 "equivalent units" wherein each graduate unit (200-level) attempted by a graduate student is considered as 1.5 units and each undergraduate unit (100-level or below) counts at face value. For example, a student enrolled for eight 200-level units would be considered a full-time student. Three-quarter time and half-time are defined to be 9 to 11½ and 6 to 8½ "equivalent units" respectively.

Under certain circumstances, a student enrolled in Graduate Continuation (zero units) to complete requirements for the master's degree (including Thesis 299, Project 298, and the Comprehensive Examination) may qualify for full-time status or a fraction thereof. The Graduate Office will verify the student's appropriate status in such cases through his/her major adviser upon request from the student.

Maximum Study Load

Graduate courses require substantially more concentrated study than do undergraduate courses. A normal load is from 9 to 12 units and the maximum allowable load is 16 units for full-time master's degree students when one or more courses in the 200 series are included. Requests for exceptions to this policy must be addressed to the Graduate Division on a petition for academic overload. Students employed full time may take a maximum of 6 units. For maximum units during the summer session see the *Summer Session Catalog.*

* In these programs, a student may *not* earn a degree without also declaring an option.

Graduate and Postbaccalaureate General Admission Requirements

Admission Requirement Summary/Definitions. Graduate and postbaccalaureate applicants may apply for a degree objective, a credential or certificate objective, or may have no program objective. Depending on the objective, the CSU will consider an application for admission in one of four categories:

- *Postbaccalaureate Unclassified.* You qualify for admission as an unclassified postbaccalaureate student if you **1)** hold an acceptable bachelor's degree from a regionally accredited institution or have equivalent preparation as determined by the campus, **2)** have a grade point average of at least 2.5 in your last 60 semester (90 quarter) units and **3)** are in good standing at the last college you attended. In unusual circumstances, a campus may make exceptions to these criteria.

If eligible in postbaccalaureate unclassified standing, you may qualify for:

- *Postbaccalaureate Classified* standing to enroll in a credential or certificate program provided you satisfy the additional professional, personal, scholastic and other standards, including qualifying examinations, as the campus may prescribe; or
- *Graduate Conditionally Classified* standing to enroll in a graduate degree curriculum if in the opinion of appropriate campus authority you can remedy any deficiencies by additional preparation; or
- *Graduate Classified* standing to enroll in a graduate degree curriculum if you satisfactorily meet the professional, personal, scholastic and other standards, including qualifying examinations, as the campus may prescribe.

Applications for Admission to Postbaccalaureate and Graduate Studies may be obtained in the Office of Admissions. All new and continuing students (students who desire to pursue studies after having received a baccalaureate degree), are required to file this application.

All students who meet the admission requirements for postbaccalaureate studies receive a notice of *unclassified standing* from the Office of Admissions. Admission to *classified standing* involves the additional step of an evaluation of the student's record and other documents in accordance with the admission criteria of the program in question. Admission to classified graduate standing is the responsibility of the Office of the Division of Graduate Studies and Research. Admission to classified postbaccalaureate standing in credential programs is the responsibility of the School of Education and Human Development.

Admission to a state university or college with postbaccalaureate unclassified standing does not constitute admission to graduate degree or credential curricula.

Postbaccalaureate students interested in pursuing a second bachelor's degree or a second undergraduate major should contact the appropriate academic department or the Division of Graduate Studies and Research.

A graduate of a nonaccredited college may be granted admission with *unvalidated unclassified postbaccalaureate standing,* upon the filing of the application and two copies of official transcripts of all college work. Such a student may be eligible for placement in regular postbaccalaureate or graduate standing when he or she has cleared all undergraduate deficiencies and has maintained, in residence at CSU, Fresno, a grade point average of 3.0 on 12 units of approved upper-division work or an average of 2.5 on 24 units of approved upper-division work. (Prospective applicants to master's degree programs, see also *Master's Degrees — Grade Requirements.*) When a student with unvalidated postbaccalaureate standing has met the above requirements, it is his or her responsibility to request a new statement of standing from the Admissions Office.

International Graduate Student Admission

TOEFL Requirement. All graduate and postbaccalaureate applicants, regardless of citizenship, whose preparatory education was principally in a language other than English must demonstrate competence in English. Those who do not possess a bachelor's degree from a postsecondary institution where English is the principal language of instruction must receive a minimum score of 550 on the Test of English as a Foreign Language (TOEFL). Some campuses may require a higher score. Applicants to the English program must attain a score of 600. The TOEFL scores, Graduate Record Examination Aptitude Test Scores, application, and official academic documents should reach the university Admissions Office at least six months before the semester for which admission is desired. Applicants to the Accountancy and MBA programs must submit Graduate Management Admissions Test scores; applicants to the MPA and Agricultural Business programs may submit either GMAT or GRE scores. The TOEFL is administered at various centers throughout the world. For further information about the TOEFL, write or phone the educational attaché at the nearest U.S. embassy or consulate office or write to the Office of Testing Services, California State University, Fresno; 1700 E. Bullard, Fresno, CA 93740, U.S.A.

The Office of the Dean of Graduate Studies and Research will forward inquiries to the appropriate department.

Requests for applications for international admission should be directed to International Admissions, California State University, Fresno; 5241 N. Maple Ave., Fresno, CA 93740, U.S.A.

Note: The university's Division of Graduate Studies and Research accepts graduate students from abroad with strong academic preparation. During the first semester at CSU, Fresno, foreign graduate students whose native language is not English and who are studying in this country for the first time must enroll in special courses in American language and civilization through the International Study program. These required courses are assigned according to the results of on-campus testing and are designed to speed adaptation to the new environment and to provide the greatest possibility of success in graduate studies.

Admission to Master's Degree Programs — Graduate Standing

Applications for admission to graduate studies are returned to the Office of Admissions. Simultaneously, the applicant must ensure that official transcripts of all previous college or university level work also are sent to the Office of Admissions by the registrar of institutions previously attended. In addition, GRE or GMAT scores as required by the department to which you apply also must be forwarded to the university. Check with the department to ascertain whether an additional departmental application and letters of recommendation are

required. In order to ensure adequate consideration for admission, applicants are advised to submit all complete official documentation by established deadlines.

Applicants to all master's degree programs gain admission in either classified or conditionally classified graduate standing. Many programs impose additional requirements beyond the criteria stated here and the student is invited to consult departmental descriptions elsewhere in this catalog. To be eligible to receive the master's degree at CSU, Fresno, students must be advanced to candidacy and complete all other requirements specified in this catalog by the Division of Graduate Studies and Research and the specific program. Furthermore, candidates for the master's degree must demonstrate a command of the field of specialization and a competence in independent investigation, analysis, and synthesis beyond the scope of individual courses. Students wishing to change their major must contact the Division of Graduate Studies and Research and apply for the change formally. Students are not admitted to master's degree programs unless they have received an admission notice from the Division of Graduate Studies and Research.

Graduate Standing-Conditionally Classified

A student eligible for admission to a California State University campus under the unclassified postbaccalaureate standard above, but who has deficiencies in prerequisite preparation which in the opinion of the appropriate campus authority can be met by specified additional preparation, including qualifying examinations, may be admitted to an authorized graduate degree curriculum with conditionally classified standing.

A student who indicates on the application for admission that he or she wishes to pursue a master's degree objective is considered for classified graduate standing. Applicants who do not meet all the specified criteria for admission to a master's degree program with full classified standing may be recommended for conditionally classified standing by the graduate committee of the program in question. Such a recommendation is accompanied by a statement of the additional requirements (i.e. appropriate baccalaureate preparation including prerequisites) which must be met before full classified standing is granted. This information is communicated to the student by the Office of the Division of Graduate Studies and Research. It is the student's responsibility to request a change in classification status as soon as the specified conditions have been met. Forms for this purpose may be obtained in the Office of the Division of Graduate Studies and Research or from your graduate adviser.

Note: Students who have been granted conditional admission to a graduate program are required to complete all conditions for achieving classified status (full admission) to the program by the semester in which a maximum of 10 units to be used toward the master's degree is completed. In programs of 60 units, except counseling, classification must occur prior to the completion of 30 units. Failure to attain classified standing in a timely manner as outlined above may result in the loss of units to be applied toward the degree since excess units may not be listed on the Petition for Advancement to Candidacy.

Graduate Standing-Classified

A student eligible for admission to a California State University campus in unclassified or conditionally classified standing may be admitted to an authorized graduate degree curriculum of the campus as a classified graduate student if he or she satisfactorily meets the professional, personal, scholastic, or other standards for admission to the graduate degree curriculum including qualifying examinations, as the appropriate campus authority may prescribe.

Only those applicants who show promise of success and fitness will be admitted to master's degree curricula, and only those who continue to demonstrate a satisfactory level of scholastic competence and fitness shall be eligible to proceed in such curricula. (See also, *Grade Requirements*.)

Admission to classified graduate standing in a master's degree program at CSU, Fresno requires satisfactory scores on the Graduate Record Examination (GRE) Aptitude Test, or for accountancy and business students, the Graduate Management Admission Test (GMAT). Applicants for admission to the agricultural business and MPA programs may submit either GRE or GMAT scores. Check with the master's program to which you wish to apply to determine the minimum score required for you to achieve. Although some programs require a passing score in either the verbal or the quantitative portions of the GRE, students must complete all portions, including the analytical portion, of the examination. These tests plus the advanced test are part of a nationally standardized group of examinations prepared and scored by the Educational Testing Service and are given several times a year in various parts of the world; students taking the test at any of the testing centers may request that their scores be sent to the CSU, Fresno Testing Office. The Testing Office administers the tests on the Fresno campus. Information about dates, fees, and application procedures may be obtained from the Testing Office or the Office of the Division of Graduate Studies and Research.

GRE Aptitude Test or GMAT score reports must be on file in the CSU, Fresno Graduate Office in time for consideration along with the application for admission to graduate standing. It is necessary therefore that the appropriate test be taken well in advance of the first semester of graduate study. While the GRE Aptitude Test is a general requirement, in the absence of satisfactory test scores, departments have the option of recommending other types of diagnostic tests or substituting other measures of aptitude for those students whose records otherwise indicate probable success in graduate study.

Note: A student normally attains classified standing at admission. However, if prerequisites were assigned under conditional classification, classified standing must be attained no later than the semester in which a student completes 10 units, including transfer and post-baccalaureate credit, to be used toward the master's degree. In 60 unit programs, counseling excepted, a limitation of 30 units is applicable. A student is expected to attain classified standing either at admission or during the first semester of studies. Candidates for classification are expected to possess a 3.0 or better grade point average in course work undertaken for use toward the master's degree.

Advancement to Candidacy

Classified graduate standing gives a student permission to work toward qualifying for candidacy. Advancement to candidacy gives a student permission to proceed toward qualifying for the degree and must have been attained prior to enrollment in the culminating experience (i.e. 299 thesis, 298 project, comprehensive examination). Requirements for advancement to candidacy include the following:

1. Classified graduate standing. If a student is not classified by the semester in which a maximum of 10 units to be used toward the master's degree is completed, then not

more than 10 units (including transfer and post-baccalaureate credit) completed before achieving full classified standing at CSU, Fresno, may be listed on the Petition for Advancement to Candidacy. Work taken during the semester of classification is considered to be completed in classified standing and may be listed on the Petition for Advancement to Candidacy. Exception: In 60-unit programs, except counseling, the above limitation applies only to the last 30 units.

2. Completion of any additional prerequisites which the adviser specifies in writing.
3. If required, satisfactory completion of the Graduate Record Examination Advanced Test or departmental qualifying examination. The Graduate Record Examination Advanced Test in the major subject field is required of students working toward the master of arts degree in biology, English (literature option only), international relations (government), psychology, and the Master of Science degrees in geology, marine sciences, mathematics, and physics. A departmental qualifying examination is required in agricultural business, art, criminology, geography, industrial arts, mass communication, nursing, physical education, physics (M.A.), public administration, rehabilitation counseling, speech, and city and regional planning.
4. A minimum grade point average of 3.0 (both overall and at CSU, Fresno) on all upper-division and graduate course work from the date of embarking on the first course of the proposed master's degree program. (See also, *Grade Requirements*.)
5. Satisfactory completion of the foreign language requirement for those programs having such a requirement. (See *Foreign Language Requirement*.)
6. Departmental recommendation for advancement to candidacy on a petition form available in the Office of the Division of Graduate Studies and Research. In making this recommendation, the department takes into account professional and personal standards as well as scholastic achievement as revealed by grades and performance on examinations. The student is responsible for ensuring that the adviser has sufficient information other than grades and scores on which to make this recommendation. On this petition form the student, in consultation with his adviser, lists the coherent set of courses which, when approved, will constitute his degree program.
7. Completion in graduate standing at CSU, Fresno, of at least 9 units of the proposed program with a 3.0 average on all completed work appearing on the program.
8. Submission to the Office of the Dean, Division of Graduate Studies and Research, of the properly signed petition for advancement to candidacy. Advancement to candidacy must be attained no later than the semester (or summer) preceding the semester (or summer) in which the student applies for, and is granted, the master's degree. The student is responsible for adhering to deadlines established by the Graduate Division for the submission of Advancement forms. Approximate deadlines are October 1 (fall) and March 1 (spring). Forms received after these deadlines are considered late and will be processed as time allows. Students may not expect to be advanced to candidacy and to graduate in the same semester.
9. In keeping with the university's graduate-level writing proficiency requirement, all graduate students must demonstrate their competence with regard to writing skills prior to advancement to candidacy. The department will note on the Petition for Advancement to Candidacy form the means by which the student has met the writing skills requirement. (See also *University Writing Skills Requirement*.) Credit earned on the undergraduate university examination assigned solely to meet this requirement may not be used on a graduate student's approved program. Certain 200 series courses with significant assignments indicative of a successful graduate level writing proficiency may be used to meet the writing requirement. These courses, if approved, may be included on a student's program for the master's degree. For a list of courses approved for this purpose consult either the graduate dean or the program adviser. The written departmental qualifying examination may be used to meet this requirement.

Foreign Language Requirement

Foreign language is not a general requirement for admission to or completion of the master's degree program at California State University, Fresno.

However, for advancement to candidacy, demonstration of competence, usually equivalent to that achieved through two years of collegiate study of one foreign language, is required in specified majors in which upper-division and graduate courses demand such competence. Consult your graduate adviser or the chair of the foreign language department for information about placement tests.

Competence in the use of a foreign language is required for advancement to candidacy for the Master of Arts degree in English, music (vocal performance and music history only). The foreign language requirement for the M.A. in International Relations is a prerequisite for graduation rather than Advancement to Candidacy. Ordinarily the requirement calls for demonstration of the ability to read materials of the major in one appropriate foreign language. Geology and history, however, specify that a student doing a thesis involving a foreign country must have a reading knowledge of the language of that country. Curricula not specified above do not require a foreign language.

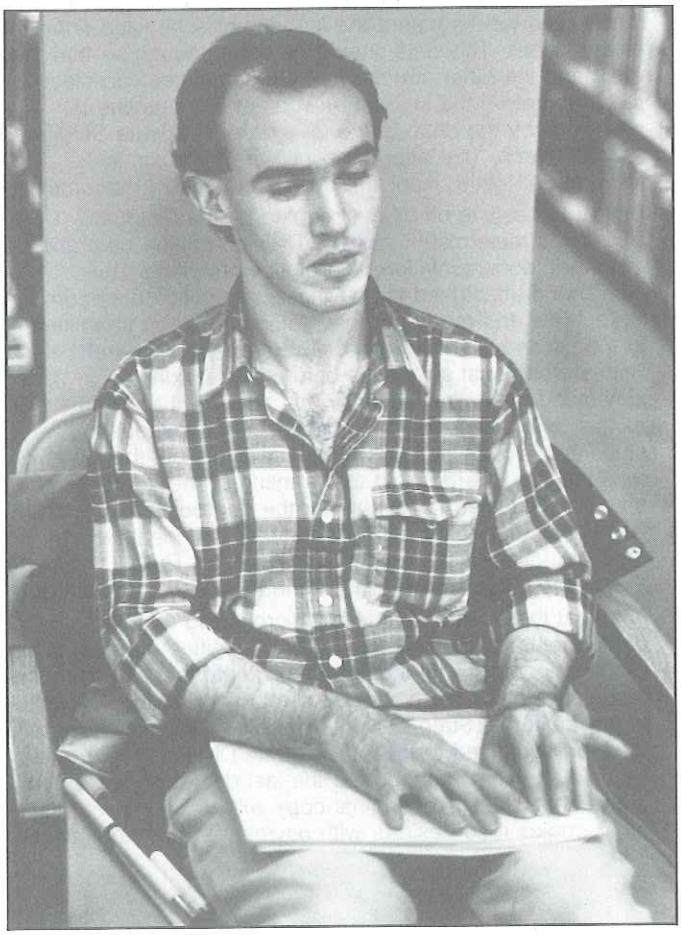
Program Requirements

The program requirements for the Master of Arts and Master of Science degrees assume substantial undergraduate preparation in the field. See school and departmental statements in this catalog for particulars. A student lacking this preparation will find it necessary to exceed the minimum requirements indicated below.

The approved degree program for the master's degree is a coherent pattern of (1) specific requirements for the program and (2) additional courses selected to meet the student's particular needs. It consists of at least 30 units completed after the bachelor's degree and five years just preceding the granting of the master's degree. Only graduate courses (200 series) and such upper-division courses (100 series) as are recommended by the schools or departments and approved by the University Graduate Committee are acceptable on the unit requirement. Other courses are counted in calculating the student's study load, but cannot be counted toward the unit requirement for the master's degree. The approved program must be consistent with the following policies:

1. At least 21 units of the program must be CSU, Fresno, residence credit, and all units used toward the degree, must be completed within 5 years. Courses that were used to satisfy the requirements of a previous degree may not be used on the program.

a. Transfer credit may be used toward a master's degree only if the institution offering the work is accredited (A-rated) and would use it on a comparable master's degree program, and if it is judged by appropriate university authorities to be particularly relevant to the individual student's program. The student must present appropriate documentation, including official transcripts of work completed and xerographic copies from the catalog of the institution where the transfer work was taken, as follows: the relevant course description(s), evidence that the course(s) may be used toward a master's degree at that institution, the course numbering and grading systems. Extension and concurrent credit are not regularly used on master's degree programs. Concurrent enrollment is restricted to non-degree-seeking professionals and may not be used to by-pass the university fee structure. In the event that the extension course is offered under conditions similar to those for a course normally usable on a master's program, a student may request special permission to use such an extension course on his program. Two-hundred series courses taken through Extension count as upper-division courses when used toward the master's degree. If approved, a maximum of 9 transfer (including CSUF Extension) units may be used on a 30 unit program. Student teaching credit is not ordinarily used on master's degree programs. In unusual circumstances, if student teaching is demonstrably appropriate to a program, up to 3 units of such work may be approved by the Graduate Council.



b. Credit by Examination may be used to fulfill prerequisites, but may not apply toward the 30 units.

c. Saturday-School courses may not be used on a student's program for the master's degree.

d. Neither CAPSTONE nor Undergraduate Writing 'W' courses may be used in fulfillment of the program requirements of the master's degree.

e. Credit for coursework earned through *CR/NC* in fall 1978 and in subsequent semesters may not be applied toward the master's degree unless the course has been designated as available for *CR/NC* only by the University Graduate Committee. A maximum of 6 units of *CR/NC* only credit may be applied to a 30 unit master's degree program and a maximum of 12 units of *CR/NC* only credit may be applied to a 60 unit program. Exception: M.S.W. students may use 16 units of such credit.

f. With approval of the departmental graduate adviser, postbaccalaureate credit allowed for work taken in the semester or summer in which the baccalaureate degree is granted may be applied toward a master's degree, if it meets master's degree criteria in all respects. However, the amount of postbaccalaureate credit used toward the master's degree may not exceed one-third of the student's entire approved program.

g. Courses may not be included on the advancement to candidacy form if they do not fall within the 5-year limit. See *Postbaccalaureate Credit*.

h. Refer to catalog section concerning Independent Study.

2. A minimum of one-half of the courses in a student's program for the master's degree must be graduate level courses numbered in the 200 series. Most programs require more than the minimum 15 units in a 30-unit program, or more than 30 units in a 60-unit program.

3. Normally, substitutions for regular departmental requirements must be accompanied by an adequate written justification appended to the advancement form.

4. A culminating experience is required for each master's degree. Acceptable culminating experiences include thesis, project or comprehensive examination. Individual departments permit one or more culminating experiences described below.

   a. A thesis is the written product of the systematic study of a significant problem. It clearly identifies the problem, states the major assumptions, explains the significance of the undertaking, sets forth the sources for and methods of gathering information, analyzes the data, and offers a conclusion or recommendation. The finished product must evidence originality, critical and independent thinking, appropriate organization and format, clarity of purpose and accurate and thorough documentation. Normally an oral defense of the thesis will be required.

   b. A project is a significant undertaking of a pursuit appropriate to the fine and applied arts or to professional fields. It must evidence originality and independent thinking, appropriate form and organization, and a rationale. It must be described and summarized in a written abstract that includes the project's significance, objectives, methodology and a conclusion or recommendation. An oral defense of the project may be required.

c. A comprehensive examination is an assessment of the student's ability to integrate the knowledge of the area, show critical and independent thinking, and demonstrate mastery of the subject matter. The results of the examination must evidence independent thinking, appropriate organization, critical analysis, and accuracy of documentation. A record of the examination questions and responses shall be maintained.

5. It is the student's responsibility to complete the specific courses listed on his/her approved program and to assure that the Degree Clearance form has been forwarded to the Graduate Division from the department. Once a program has been approved by the University Graduate Committee, it may be changed only on the written request of the student and his/her department or school adviser and with the approval of the dean, Division of Graduate Studies and Research. Forms for requesting such program adjustment are available in the Office of the Division of Graduate Studies and Research.

Criteria for Thesis and Project

No academic distinction is made between a thesis and a project. Either one is equally acceptable as a means of fulfilling the requirements for the master's degree. Specific departmental instructions or requirements should, however, be ascertained by the candidate before enrollment in Course 299.

Whether a student is preparing a thesis or a project it should be noted that quality of work accomplished is a major consideration in judging acceptability. The finished project must evidence originality, appropriate organization, clarity of purpose, critical analysis, and accuracy and completeness of documentation where needed.

Critical and independent thinking should characterize every project. Mere description, cataloging, compilation, and other superficial procedures are not adequate.

The quality of writing, format, and documentation must meet standards appropriate for publication in the scholarly journals of the field, or be consistent with the dictates of an authorized stylebook.

1. To be eligible to enroll for thesis or project, a student must have
   (a) been advanced to candidacy for the master's degree.
   (b) maintained a *B* (3.0) average on his/her approved program.
   (c) completed at least 9 units of his/her approved program on the Fresno campus.
   (d) completed any course in research techniques required by his major department.
   (e) secured a thesis committee, consisting of a chair and at least two other members; for project committee requirements, the student should check with his/her department.
   (f) secured approval of his/her thesis plan from the division or department graduate committee and filed in the Office of the Division of Graduate Studies and Research an official thesis committee assignment form.
2. Enrollment in Thesis units may be processed during either the regular or late registration periods of any semester after the requirements (listed in (a) through (f) above) have been met or special permission for exceptions has been granted. If, however, a student fails to enroll within one semester (excluding summer sessions) after his official acceptance by a thesis committee, the committee chair has the option of dissolving the committee, in which case a new committee must be appointed and new forms filed before registration can be processed. A student planning to register for thesis after a break in regular session attendance must be readmitted to the university. Parallel rules apply to Project enrollment.
3. A student whose thesis work is planned to extend over more than the semester in which he first enrolls may select one of the following options (with the approval of his graduate adviser): (a) he may register in 299 each term he is working on the thesis with the number of units for each registration reduced so that the total number of units accumulated in 299 does not exceed the limit set by the department; (b) register for the total number of units of 299 in one semester and complete work in subsequent semesters under Graduate Studies Continuation, a zero-unit course required for enrollment purposes; (c) option (a) supplemented by GS Continuation when the maximum number of units is attained with the thesis still incomplete. (See *Continuous Enrollment* below.) Parallel rules apply to Project students.
4. If work in 299 is not completed at the end of the term of registration, but is progressing satisfactorily, an *SP* (Satisfactory Progress) grade is recorded. If the *SP* grade is not replaced within two years by a letter grade, the department may require the student to re-register for the course.
5. The student and the thesis chair should set a deadline for the completion of the semifinal draft. It should be no later than seven weeks before the last day of scheduled final examinations. This date should be early enough so that the chair and the other members of the committee can clear the draft before the student must meet the deadline for clearance by the dean of the division of Graduate Studies and Research. The latter deadlines are approximately November 1 (fall), April 1 (spring) and June 1 (summer).
6. Before a thesis is officially accepted by the Graduate Division, it must meet Graduate Division criteria on matters of format, documentation, and quality of writing. The semifinal draft, signed by the thesis committee members as acceptable and ready for final typing should be submitted to the Office of the Division of Graduate Studies and Research at least six weeks before the last day of scheduled final examinations. This deadline has been set as late as possible in the semester to accommodate the student; late manuscripts will be accepted, but the student runs the risk of a delay in the granting of the degree and may be requested to reapply for the degree to be granted in a subsequent semester (or summer). Students are urged to follow meticulously *Guidelines for Thesis Preparation;* copies are available in the Kennel Bookstore.
7. The final thesis (an original for microfilming and two photocopies) signed by the thesis committee and ready for binding, together with the school or departmental clearance and a receipt for the binding and microfilming fee (payable in the California State University, Fresno Association office) must be submitted to the Office of the Division of Graduate Studies and Research, before the last day assigned by the thesis consultant. The original copy will be bound with the other copies if so desired, with payment of the required fee.

Continuous Enrollment

It is the policy of the Division of Graduate Studies and Research that a graduate student must be enrolled at the university if university faculty, library, or laboratory resources are used while completing a grade of *SP* in either thesis or project, an *SP* or *I* in any other course, or while preparing to take a comprehensive examination. This policy does not apply when the student is enrolled in any regular course for a letter grade. To otherwise maintain enrollment as required, a student enrolls in Graduate Studies Continuation through Extended Education or in GS 299 through regular (university) enrollment. In either case, the student may obtain further information from the Graduate Division. A student who must suspend work for more than one semester on the thesis or other courses in which the *SP* grade was given should apply for a planned educational leave of absence. Summer sessions are exempt from the continuous enrollment policy. (See also *Other Graduate Curricula — Graduate Studies and Planned Educational Leave of Absence.*)

Time Limitations and Validation

A period of five years is allowed for the completion of all requirements for the master's degree. This time limit is indicated for each student on the approved advancement to candidacy form. A student whose program has been interrupted by military service should consult the dean of the Division of Graduate Studies and Research about provisions for military extensions. Outdated coursework will not be approved for inclusion on the Petition for Advancement to Candidacy at the time formal approval is granted to the petition. Those courses completed more than five years before the date for completion of all requirements for the master's degree cannot be used to meet total unit requirements except through validation as follows:

Out of date coursework may only be validated if such work has been previously approved on this Petition for Advancement to Candidacy. A maximum of one-third of required degree units may thus be validated by such means as are recommended by the department and approved by the graduate dean.

Grade Requirements

All graduate students will be held to the scholarship standards listed under *Academic Regulations*. The following provisions also apply to master's degree programs.

A student admitted to a master's degree program in conditional classified or classified standing is required to maintain a minimum grade-point average of *B* on all work taken subsequent to admission to the program.

No course with a grade below *C* may apply on an approved program for the master's degree.

To be eligible for advancement to candidacy, a student must have earned at least a *B* average (both overall and at CSU, Fresno) on all coursework completed after the date of embarking on the first course to be included in the master's degree program.

To be eligible for enrollment in the thesis or project, a student must have been advanced to candidacy and must have maintained a minimum grade-point average of *B* on his/her approved program.

To be eligible for the granting of the degree, a student must have maintained a *B* average on his/her complete approved program. Any grade earned in a course on the approved program continues to figure in the grade point average, even if that course is for any reason later dropped from the program.

To be eligible to receive the master's degree *with distinction* a student must have earned at least a 3.9 grade point average on all coursework taken from the first semester of the approved master's degree program. A minimum GPA of 3.9 must also be attained on the approved program to qualify.

Appeals and Petitions

Graduate (master's degree) students wishing to request substitutions or modifications in a department's degree requirements should initiate their request through the department's graduate committee. Requests for exceptions to established university policies governing graduate study may be addressed to the dean, Division of Graduate Studies and Research and also to the University Graduate Committee. Grade protests must be submitted to the Student Academic Petitions Committee through the director of Advising and Orientation according to university policy. Information concerning grade protest procedures is available in the Office of the Dean of Students.

Request That Master's Degree Be Granted

A request that the master's degree be granted (which includes the graduation fee payable in the Business Office) must be filed in the first two weeks of the semester in which the work is to be completed. In addition, applicants must be enrolled (See *Continuous Enrollment*). During the summer, the request should be filed before the end of the first week of the first session. (See *Academic Calendar, Schedule of Courses, and Fees and Expenses.*) Application forms are available in the Student Records and Evaluations Office. Prior to filing a request for the master's degree to be granted, the student should check with the graduate committee chairman of the master's program concerned in order to ensure that all program requirements have been, or will soon be, completed. Diplomas for those completing degree requirements during summer sessions and at midyear will be awarded approximately four to six months after the end of the term.

Failure to complete requirements for the degree during the semester (or summer) of the application necessitates the filing of a new application, including a re-application fee, for the semester of actual completion. Such reapplication is subject to the same time schedule as the original application.

COURSE

Graduate Studies (G S)

300T. Topics in Graduate Studies and Research (1–3). Topics related to the nature of graduate education, to the purpose and background of research and scholarly activity in the graduate enterprise, including participation in aspects of ongoing research conducted by faculty.



UNIVERSITY ADMINISTRATION AND POLICIES

Advisory Board

The Advisory Board consists of community leaders who are interested in the welfare of the university. The board advises the president of the university in matters that relate to the advancement of the university in its relation to the community.

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Rutherford B. Gaston
Mildred Huddleston
Larry Jones
Judith T. Lau
Armando O. Rodriguez, Chair
Donald J. Schafer
Rose Shamlin
Jeffrey H. Smith
Gerald L. Tahajian
J. Frank Villegas
Daniel K. Whitehurst

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Assistant to the President.....Marjorie M. Johnson
Special Assistant to the President.....Alexander Gonzalez
Director of Affirmative Action and Assistant to the President.....Arthur V. N. Wint
Director of Institutional Research.....Harold L. Best
Assistant Director of Institutional Research.....Jeannine M. S. Raymond

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Assistant Vice President for Academic Affairs — Academic Personnel.....Michael J. Biechler
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Assistant Vice President for Academic Affairs — Budget and Instructional Resources.....Helen J. Gigliotti
Special Assistant to the VPAA/Director, Instructional Media Services.....David F. Quadro
Acting Director, Instructional Media Center.....Wymond W. Eckhardt
Director of Instructional Telecommunication Center.....Russ A. Hart
Director of Developmental Learning Resource Center.....David A. Bezayiff
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Associate Dean, Academic Affairs.....Carl L. Pherson
Associate Dean, Ag. Oper.....Harry P. Karle
Associate Dean, Director, CATI.....Jon D. Shaver
Dean of the School of Arts and Humanities..*To be appointed*
Associate Dean.....Robert G. Ware
Dean of the School of Business and Administrative Sciences.....Joseph J. Penbera
Assistant Dean.....Luis Ma. R. Calingo
Dean of the School of Education and Human Development and Director of Teacher Education.....Barbara G. Burch
Associate Dean.....Robert H. Monke
Dean of the School of Engineering.....Elden K. Shaw
Associate Dean.....Karen L. Frair
Dean of the School of Health and Social Work.....Richard D. Ford
Associate Dean.....Sanford M. Brown
Dean of the School of Natural Sciences.....Kin-Ping Wong
Associate Dean.....Stanley M. Ziegler
Dean of the School of Social Sciences.....Peter J. Klassen
Dean of Library Services.....Michael Gorman
Associate Dean, Library Services.....Stephanie Hillman
Associate Dean, Administration.....Sandra L. Gothe
Dean of the Division of Graduate Studies and Research.....Vivian A. Vidoli
Associate Dean.....David A. Ross
Grant and Contract Development Director.....*To be appointed*
Developmental Specialist.....Daniel J. Griffin
Dean of the Division of Extended Education.....Audrey S. Anderson
Associate Dean.....Kenneth C. Pascal

Vice President for Administration and External Relations.....Lynn D. Hemink
Assistant Vice President for Administration and External Relations.....Paul E. Bissonnette
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Director of Budget Planning and Administration.....Iris Matlosz
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Director of Communications.....James E. Forden
Director of Computer Services.....James R. Morris
Assistant Director for Instruction and Technical Services.....Steven A. Saltzberg
Manager of Administrative Systems and Services.....Rik H. Clausen
Planning and Budget Manager.....Gail E. Austin
Director of Development and Community Relations.....Richard K. Francois
Director of Personnel Services.....Nita R. Kobe
Payroll Officer.....Susan M. Vaquilar
Director of Plant Operations.....C. Ronald Hicks
Director of Procurement and Administrative Services.....James P. Van Auken
Director of Public Information.....James B. Miller
Director of Space and Facilities Planning.....Susan M. Aldrich
Facilities Planner.....Paul R. Epp
Executive Director of the Alumni Association.....Linda Van Kirk
University Police Chief.....William A. Anderson
Environmental Health and Safety Officer.....David Terstegen

Dean of Student Affairs.....William H. Corcoran
Associate Dean.....Thomas P. Boyle
Associate Dean.....Manuel Perez
Assistant Dean.....Robert E. Lundal
Director of Admissions/Records/
Evaluations.....Richard L. Backer
Coordinator, Admissions
Officer.....Carroll C. Cotten
Coordinator, Administrative
Services and Records.....W. Ward Nelson
Registrar.....Minerva Escobedo
Director of Advising and
Testing Services.....J. Richard Arndt
Assistant Director.....Walter J. Pierce
Director of Career Development and
Employment Services.....Raymond Castillo
Director of Educational Opportunity
Program and Retention Services.....Robert P. Hernandez
Assistant Director.....Maxine McDonald
Director of Financial Aid.....Joseph W. Heuston Jr.
Director of Housing.....John C. Wetzel
Assistant Director.....Sherri Crahen
Assistant Director.....Charles C. Miller
Director of Reentry Program.....Arlene L. Bireline
Director of Student Activities
and Student Union.....Steven Mortensen
Coordinator of Disabled Student
Services.....Weldon Percy
Director of Student Counseling
Center.....Esteban Steve Sena
Associate Director.....Linda Gannaway
Director of International
Student Services and Programs.....Carol B. Munshower
Assistant Director.....Sonya Hildreth
Director of Student Health Services.....Robert M. Paull, M.D.
Assistant Director.....Iona F. Hammond, M.D.
Director of University
Outreach Services.....Frances Pena
Director of University Migrant Services.....Raul Diaz
Director of Upward Bound.....Sandra Mason
Director of Veterans Services.....Ernest Shelton

Director of Athletics.....Gary A. Cunningham
Associate Athletic Director.....John W. Easterbrook
Assistant Athletic Director.....Diane Milutinovich
Sports Information Director.....Scott L. Johnson
Director of Academic Support Services.....Robert G. Knudsen

Director of Auxiliary Services.....Gaylord O. Graham
California State University, Fresno Foundation
Agricultural Foundation of California State
University, Fresno
California State University, Fresno Association, Inc.
University Student Union, Director.....Steven Mortensen
Controller.....Peter Prestegard
Administrator of Campus Food Services.....Richard Finlay
Bookstore Manager.....Lawrence F. Taylor
California State University, Fresno
Athletic Corporation
Chair, Board of Directors.....Gaylord O. Graham
Director of Athletics.....Gary A. Cunningham
General Manager.....Les L. Snyder Jr.

School and Division Deans, Department Chairs and Program Coordinators

School of Agricultural Sciences and Technology ..... Charles M. Smallwood
Agricultural Economics ..... Dennis L. Nef
Animal Sciences and Agricultural Education (Acting Chair) ... Scott A. Williamson
Enology, Food Science and Nutrition ..... N. Joanne Caid
Family Studies and Home Economics ..... Nina J. Dilbeck
Industrial Technology ..... Gary E. Grannis
Plant Science and Mechanized Agriculture ... Gary L. Ritenour

School of Arts and Humanities ..... *To be appointed*
Armenian Studies Program Coordinator .... Dickran Kouymjian
Art ..... Frank B. Laury
English ..... F. Andrew Hart
Foreign Languages ..... Maurice C. Gendron
Journalism ..... James B. Tucker
Linguistics ..... Jack B. Zeldis
Music ..... Phyllis A. Irwin
Philosophy ..... Jack A. Pitt
Speech Communication ..... John A. Cagle
Telecommunications ..... R. C. Adams
Theatre Arts ..... Ronald D. Johnson

School of Business and Administrative Sciences ..... Joseph J. Penbera
Accountancy ..... Dennis M. Baker
Aerospace Studies ..... Lt. Col. Robert J. Seigel
Finance and Business Law ..... Paul M. Lange
Graduate Degrees Program Director ..... Manuchehr Shahrokhi
Information Systems and Decision Sciences ..... Harry G. Costis
Management ..... Gerald L. Jones
Marketing and Logistics ..... Richard Nordstrom
Military Science ..... Lt. Col. William F. Hausman Jr.

School of Education and Human Development ..... Barbara G. Burch
Advanced Studies ..... H. Dan Smith
Administrative Services Program (Interim Coordinator) ..... Ric S. Brown
Counselor Education Program Coordinator ..... Louis F. Markert
Graduate Degrees Program Coordinator ..... Robert H. Monke
Special Education Program Coordinator ..... Janice A. Chavez
Teacher Education ..... Bernice Bass de Martinez
Bilingual/Cross-Cultural Emphasis Program Coordinator ..... Robert D. Segura
Early Childhood Education Program Coordinator ..... Doris O. Smith
Liberal Studies Program Coordinator ..... Jacques S. Benninga
Multiple Subjects Program Coordinator ..... Judith C. Neal
Reading Specialist Program Coordinator ..... Bonnie L. Dutton
Research and Development Coordinator ..... Susan M. Tracz
Single Subject Program Coordinator ..... Jolyne S. Daughtry

School of Engineering ..... Elden K. Shaw
Civil and Surveying Engineering ..... Karl E. Longley
Electrical and Computer Engineering (Acting Chair) ..... Joseph C. Plunkett
Mechanical and Industrial Engineering ..... Delbert E. Robison

School of Health and Social Work ..... Richard D. Ford
Athletics ..... Gary A. Cunningham
Communicative Disorders ..... Kenneth G. Shipley
Health Science ..... Ronald C. Schultz
Nursing ..... Pauline Kliewer
Physical Education and Human Performance ..... Joanne W. Schroll
Physical Therapy Program Coordinator ..... Darlene L. Stewart
Recreation Administration Program Coordinator ..... Michael G. Hoffman
Rehabilitation Counseling Program Coordinator ..... E. W. (Bud) Stude
Social Work Education ..... Benjamin Cuellar

School of Natural Sciences ..... Kin-Ping Wong
Biology ..... Ronald L. Evans
Chemistry ..... David L. Zellmer
Computer Science ..... Henderson C. Yeung
Geology ..... Jon C. Avent
Mathematics ..... Robert F. Arnold
Physics ..... John R. Donaldson
Psychology ..... Terry G. Newell

School of Social Sciences ..... Peter J. Klassen
Anthropology ..... Shien-Min Jen
Chicano and Latin American Studies Program Coordinator ..... William V. Flores
Criminology ..... Max D. Futrell
Economics ..... Izumi Taniguchi
Ethnic Studies Program Coordinator ..... Robert S. Mikell
Geography ..... James S. Kus
History ..... John C. Kendall
Political Science ..... Philip F. Beach
City and Regional Planning Program Coordinator ..... Wayne V. Merchen
Sociology ..... Elizabeth N. Nelson
Women's Studies Program Coordinator ..... Susan S. Arpad

Library
Dean of Library Services ..... Michael Gorman
Associate Dean, Library Services ..... Stephanie Hillman
Associate Dean, Administration ..... Sandra L. Gothe
Acquisitions/Periodicals Department (Acting) ..... Ruth A. Kallenberg
Catalogue Department ..... Vincent J. Smith Jr.
Circulation Services ..... Patricia I. Lavigna
Collection Development ..... A. Gerald Gothe
Curriculum and Juvenile Collections ..... Betty Jo Peterson
Government Documents Department ..... Thomas J. Ebert
Map Library ..... Herbert S. Fox
Multicultural Center ..... Christina E. Carter
Music Library ..... Ronald J. Harlan
Reference Department ..... Bernice Lacks
Special Collections Department ..... Ronald J. Mahoney
Systems ..... Paula Demanett

Division of Extended Education ..... Audrey S. Anderson

Division of Graduate Studies and Research ..... Vivian A. Vidoli

Privacy Rights of Students in Education Records

The Federal Family Educational Rights and Privacy Act of 1974 (20 U.S.C. 1232g) and regulations adopted thereunder (34 C.F.R. 99) and California Education Code Section 67100 et seq., set out requirements designed to protect the privacy of students concerning their education records maintained by the campus.

Specifically, the statute and regulations govern access to student records maintained by the campus and the release of such records. In brief, the law provides that the campus must provide students access to records directly related to the student and an opportunity for a hearing to challenge such records on the grounds that they are inaccurate, misleading or otherwise inappropriate. The right to a hearing under the law does not include any right to challenge the appropriateness of a grade as determined by the instructor. The law generally requires that written consent of the student be received before releasing personally identifiable data about the student from records to other than a specified list of exceptions. The institution has adopted a set of policies and procedures concerning implementation of the statutes and the regulations on the campus. Copies of these policies and procedures may be obtained at the Office of the Dean of Student Affairs.

Among the types of information included in the campus statement of policies and procedures are: 1) the types of student records and the information contained therein; 2) the official responsible for the maintenance of each type of record; 3) the location of access lists that indicate persons requesting or receiving information from the record; 4) policies for reviewing and expunging records; 5) the access rights of students; 6) the procedures for challenging the content of student records; 7) the cost that is charged for reproducing copies of records; and 8) the right of the student to file a complaint with the Department of Education.

An office and review board have been established by the department to investigate and adjudicate violations and complaints. The office designated for this purpose is: The Family Educational Rights and Privacy Act Office (FERPA), U.S. Department of Education, 330 *C* Street, Room 4511, Washington, D.C. 20202.

The campus is authorized under the Act to release public "directory information" concerning students. "Directory information" includes the student's name, address, telephone listing, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended by the student.

The above designated information is subject to release by the campus at any time unless the campus has received prior written objection from the student specifying information that the student request not be released. Written objections should be sent to the Office of Admissions.

The campus is authorized to provide access to student records to campus officials and employees who have legitimate educational interests in such access. These persons have responsibilities in connection with the campus' academic, administrative or service functions and who have reason for using student records connected with their campus or other related academic responsibilities.

Use of Social Security Number. Applicants are required to include their Social Security number in designated places on applications for admission pursuant to the authority contained in Title 5, *California Code of Regulations,* Section 41201. The Social Security number is used as a means of identifying records pertaining to the student as well as identifying the student for purposes of financial aid eligibility and disbursement and the repayment of financial aid and other debts payable to the institution.

Research on Human Subjects

California State University, Fresno has adopted provisions for the conduct of research that employs or influences humans. All research at the university must comply with these provisions. Students must familiarize themselves with the provisions by inquiring in the departmental offices or the office of the dean of their school.

Measles and Rubella Immunizations Health Screening Provisions

The campus shall notify certain students, born after January 1, 1957, of the CSU requirement to present proof of measles and rubella immunizations by the beginning of the next term of enrollment. This is ***not*** an admissions requirement, but shall be required of students at the beginning of their second term of enrollment. Proof of measles and rubella immunizations shall also be required for certain groups of enrolled students who have increased exposure to these diseases. Those so notified who have not presented acceptable proof of the immunizations shall be notified further of the need to comply before receiving registration materials to enroll for the succeeding term.

Persons subject to these health screening provisions include: new students enrolling fall 1987 and later; readmitted students reenrolling fall 1987 and later; students who reside in campus residence halls; students who obtained their primary and secondary schooling outside the United States; students enrolled in dietetics, medical technology, nursing, physical therapy, and any practicum, student teaching, or field work involving preschool-age children, school-age children, or taking place in a hospital or health care setting.

The Student Health Center shall provide immunizations without cost to those students unable to obtain acceptable proof of immunizations.

Nondiscrimination Policy

Sex

The California State University does not discriminate on the basis of sex in the educational programs or activities it conducts. Title IX of the Education Amendments of 1972, as amended, and the administrative regulations adopted thereunder prohibit discrimination on the basis of sex in education programs and activities operated by California State University, Fresno. Such programs and activities include admission of students and employment. Inquiries concerning the application of Title IX to programs and activities of California State University, Fresno may be referred to the affirmative action coordinator (employment matters) or the Office of the Dean of Student Affairs (student matters), the campus officer(s) assigned the administrative responsibility of reviewing such matters or to the Regional Director of the Office of Civil Rights, Region 9, 221 Main Street, 10th Floor, San Francisco, California 94105.

Sexual Harassment
Discrimination on the basis of sex is prohibited by Title VII of the Civil Rights Act as well as Title IX of the Education Act. Sexual harassment is a violation of Section 703 of Title VII.

Sexual harassment refers to the unwanted imposition of sexual attention usually in the context of a relationship of unequal power, rank, or status, as well as the use of one's position of authority in the university to bestow benefits or impose deprivations on another. This applies equally to all students, staff, faculty, and administrators at California State University, Fresno. Harassment includes verbal, nonverbal, and/or physical conduct that has the intent or effect of unreasonable interference with individuals' or groups' education or work performance. This may also include actions that create an intimidating, hostile, or offensive working or learning environment. Both men and women can be the victims of sexual harassment.

Students who believe they are a victim of sexual harassment should contact Carol Munshower, the individual designated by the university president to review student complaints. She can explain the informal and/or formal complaint procedures available to students on our campus. Should you have concerns related to sexual harassment, please contact Carol Munshower, Joyal Administration Building, room 211, phone 278-2782.

Handicap
The California State University does not discriminate on the basis of handicap in admission or access to, or treatment or employment in, its programs and activities. Section 504 of the Rehabilitation Act of 1973, as amended, and the regulations adopted thereunder prohibit such discrimination. The director of Institutional Research has been designated to coordinate the efforts of California State University, Fresno to comply with the act and its implementing regulations. Inquiries concerning compliance may be addressed to Dr. Harold L. Best at Thomas Administration Building, Room 105, phone 278-3906.

Race, Color, or National Origin
The California State University complies with the requirements of Title VI of the Civil Rights Act of 1964 and the regulations adopted thereunder. No person shall, on the grounds of race, color or national origin be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program of The California State University.

Age, Marital Status, Religion or Sexual Preference
The California State University does not discriminate on the basis of age, marital status, religion or sexual preference.

Student Discipline

Inappropriate conduct by students or by applicants for admission is subject to discipline as provided in Sections 41301 through 41304 of Title 5, *California Code of Regulations*. These sections are as follows:

Article 1.1, Title 5, *California Code of Regulations*

41301. Expulsion, Suspension and Probation of Students. Following procedures consonant with due process established pursuant to Section 41304, any student of a campus may be expelled, suspended, placed on probation or given a lesser sanction for one or more of the following causes which must be campus related:

(a) Cheating or plagiarism in connection with an academic program at a campus.

(b) Forgery, alteration or misuse of campus documents, records, or identification or knowingly furnishing false information to a campus.

(c) Misrepresentation of oneself or of an organization to be an agent of a campus.

(d) Obstruction or disruption, on or off campus property, of the campus educational process, administrative process or other campus function.

(e) Physical abuse on or off campus property of the person or property of any member of the campus community or of members of his or her family or the threat of such physical abuse.

(f) Theft of, or non-accidental damage to, campus property or property in the possession of, or owned by, a member of the campus community.

(g) Unauthorized entry into, unauthorized use of or misuse of campus property.

(h) On campus property, the sale or knowing possession of dangerous drugs, restricted dangerous drugs or narcotics as those terms are used in California statutes, except when lawfully prescribed pursuant to medical or dental care, or when lawfully permitted for the purpose of research, instruction or analysis.

(i) Knowing possession or use of explosives, dangerous chemicals or deadly weapons on campus property or at a campus function without prior authorization of the campus president.

(j) Engaging in lewd, indecent or obscene behavior on campus property or at a campus function.

(k) Abusive behavior directed toward, or hazing of, a member of the campus community.

(l) Violation of any order of a campus president, notice of which had been given prior to such violation and during the academic term in which the violation occurs, either by publication in the campus newspaper, or by posting on an official bulletin board designated for this purpose, and which order is not inconsistent with any of the other provisions of this Section.

(m) Soliciting or assisting another to do any act which would subject a student to expulsion, suspension or probation pursuant to this Section.

(n) For purposes of this Article, the following terms are defined:

(1) The term "member of the campus community" is defined as meaning California State University Trustees, academic, non-academic and administrative personnel, students, and other persons while such other persons are on campus property or at a campus function.

(2) The term "campus property" includes:

(A) real or personal property in the possession of, or under the control of, the Board of Trustees of the California State University, and

(B) all campus feeding, retail or residence facilities whether operated by a campus or by a campus auxiliary organization.

(3) The term "deadly weapons" includes any instrument or weapon of the kind commonly known as a blackjack, slingshot, billy, sandclub, sandbag, metal knuckles, any dirk, dagger, switchblade knife, pistol, revolver, or any other firearm, any knife having a blade longer than five inches, any razor with an unguarded blade, and any metal pipe or bar used or intended to be used as a club.

(4) The term "behavior" includes conduct and expression.

(5) The term "hazing" means any method of initiation into a student organization or any pastime or amusement engaged in with regard to such an organization which causes, or is likely to cause, bodily danger, or physical or emotional harm, to any member of the campus community; but the term "hazing" does not include customary athletic events or other similar contests or competitions.

(o) This Section is not adopted pursuant to Education Code Section 89031.

(p) Notwithstanding any amendment or repeal pursuant to the resolution by which any provision of this Article is amended, all acts and omissions occurring prior to that effective date shall be subject to the provisions of this Article as in effect immediately prior to such effective date.

41302. Disposition of Fees: Campus Emergency; Interim Suspension. The president of the campus may place on probation, suspend or expel a student for one or more of the causes enumerated in Section 41301. No fees or tuition paid by or for such student for the semester, quarter or summer session in which he or she is suspended or expelled shall be refunded. If the student is readmitted before the close of the semester, quarter or summer session in which he or she is suspended, no additional tuition or fees shall be required of the student on account of the suspension.

During periods of campus emergency, as determined by the president of the individual campus, the president may, after consultation with the chancellor, place into immediate effect any emergency regulations, procedures and other measures deemed necessary or appropriate to meet the emergency, safeguard persons and property, and maintain educational activities.

The president may immediately impose an interim suspension in all cases in which there is reasonable cause to believe that such an immediate suspension is required in order to protect lives or property and to ensure the maintenance of order. A student so placed on interim suspension shall be given prompt notice of charges and the opportunity for a hearing within 10 days of the imposition of interim suspension. During the period of interim suspension, the student shall not, without prior written permission of the president or designated representative, enter any campus of the California State University other than to attend the hearing. Violation of any condition of interim suspension shall be grounds for expulsion.

41303. Conduct by Applicants for Admission. Notwithstanding any provision in this Chapter 1 to the contrary, admission or readmission may be qualified or denied to any person who, while not enrolled as a student, commits acts which, were he/she enrolled as a student, would be the basis for disciplinary proceedings pursuant to Sections 41301 or 41302. Admission or readmission may be qualified or denied to any person who, while a student, commits acts which are subject to disciplinary action pursuant to Section 41301 or Section 41302. Qualified admission or denial of admission in such cases shall be determined under procedures adopted pursuant to Section 41304.

41304. Student Disciplinary Procedures for the California State University. The chancellor shall prescribe, and may from time to time revise, a code of student disciplinary procedures for the California State University. Subject to other applicable law, this code shall provide for determinations of fact and sanctions to be applied for conduct which is a ground of discipline under Sections 41301 or 41302, and for qualified admission or denial of admission under Section 41303; the authority of the campus president in such matters; conduct related determinations on financial aid eligibility and termination; alternative kinds of proceedings, including proceedings conducted by a Hearing Officer; time limitations; notice; conduct of hearings, including provisions governing evidence, a record and review; and such other related matters as may be appropriate. The chancellor shall report to the Board actions taken under this section.

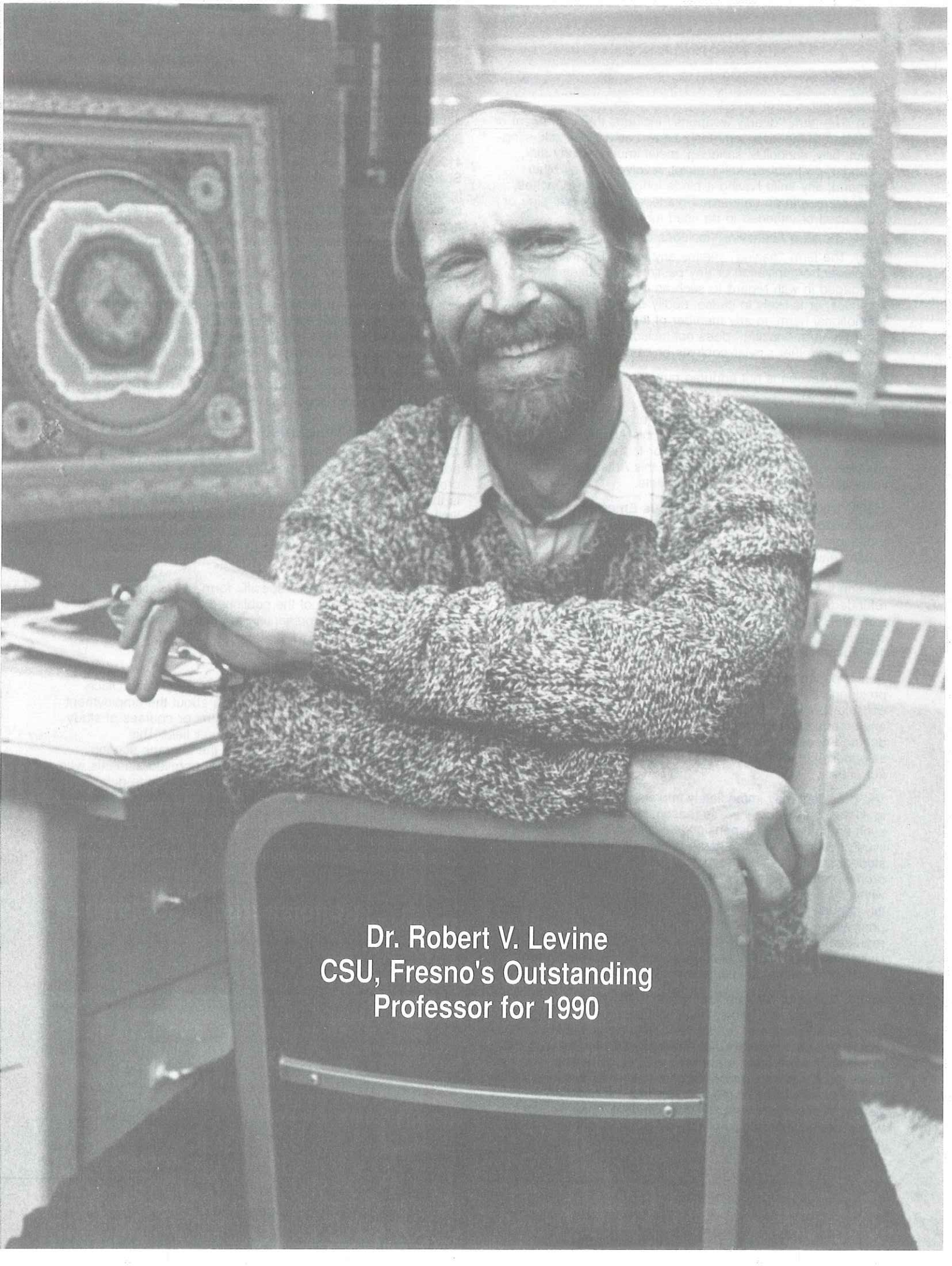
Cheating and Plagiarism

Cheating: Cheating is the practice of fraudulent or deceptive acts for the purpose of improving a grade or obtaining course credit. Typically, such acts occur in relation to examinations. It is the intent of this definition that the term *cheating* not be limited to examinations situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means.

Plagiarism: Plagiarism is a specific form of cheating that consists of the misuse of the published and/or unpublished works of another by representing the material so used, as one's own work.

Career Placement Policy

The Career Development and Employment Services Office may furnish, upon request, information about the employment of students who graduate from programs or courses of study preparing students for a particular career field. This information includes data concerning the average starting salary and the percentage of previously enrolled students who obtained employment. The information may include data collected from either graduates of the campus or graduates of all campuses in The California State University.



Dr. Robert V. Levine
CSU, Fresno's Outstanding
Professor for 1990

FACULTY AND ADMINISTRATION INDEX

Faculty and Administration 1989–90

Note: Numbers in parentheses indicate year of appointment at California State University, Fresno.

HAAK, HAROLD H., *President* (1980)
Professor, Department of Political Science
B.A., M.A., University of Wisconsin;
Ph.D., Princeton University.

ABHOLD, RAYMOND H. (1989)
Associate Professor, Department of Biology
B.S., University of Washington; M.S., Ph.D., Rutgers University, New Brunswick.

ABOU-GHORRA, IBRAHIM M. (1956)
Professor, Department of Psychology
B.A., Cairo University; Diploma, Ain-Shams University (Egypt); Diploma, Cairo Institute of Higher Studies; M.A., Ohio State University; Ph.D., University of Southern California; Licensed Psychologist.

ABRAMSON, SHAREEN (1981)
Professor, Department of Teacher Education
B.A., University of California, Los Angeles; M.A., Antioch University; Ph.D., Vanderbilt University.

ADAMS, CORA M. (1986)
Associate Professor, Department of Social Work Education; Field Coordinator
B.A., California State University, Sacramento; M.S.W., D.S.W., University of Utah.

ADAMS, KATHERINE L. (1983)
Associate Professor, Department of Speech Communication
B.S., M.A., University of Wyoming; Ph.D., University of Utah.

ADAMS, PAUL C. (1987)
Associate Professor, Department of Journalism
B.A., University of Oklahoma, Norman; M.A., Ph.D., University of Texas at Austin.

ADAMS, R. C. (1965)
Professor, Chair, Department of Telecommunications
B.A., Idaho State College; M.A., Ph.D., University of Oregon.

ADAMS, RONALD G. (1980)
Head Basketball Coach, Department of Athletics
B.A., Fresno Pacific College; M.A., California State University, Fresno.

ADRIAN, MERLE S. (1973)
Professor, Department of Industrial Technology
B.S., M.A., California State University, Fresno; Ed.D., University of Southern California.

AIKEN, JOYCE B. (1956–1958; Spring 1962)
Professor, Department of Art
B.A., M.A., California State University, Fresno.

ALDEN, H. LEE, JR. (1960)
Associate Professor, Department of Telecommunications
B.A., University of Virginia.

ALDRICH, KENNETH R. (1988)
Lecturer, Department of Physical Education and Human Performance
B.A., California State University, San Bernardino; M.A., University of Oregon.

ALDRICH, LESLIE L. (1955)
Professor, Department of Industrial Technology
B.A., Willamette University; M.A., Oregon State College.

ALFORD, LYNN C. (1988)
Assistant Professor, Department of Advanced Studies
B.A., M.A.T., Rockford College; Ph.D., University of Northern Colorado.

ALI, MIR K. (1968)
Professor, Department of Mathematics
B.S., M.A., Osmania University; M.S., Montana State University; Ph.D., Washington State University.

ALLEN, KATHLEEN R. (1981)
Lecturer, Department of Information Systems and Decision Sciences
B.A., California State University, Fresno; M.A., University of California, Los Angeles.

ALLENDER, JUDITH A. (1987)
Lecturer, Department of Nursing
B.S., State University of New York at Plattsburgh; M.Ed., Xavier University; M.S.N., Wright State University.

ALLISON, ROBERT J. (1967)
Professor, Department of Economics
B.A., M.S., Ph.D., University of Colorado.

ALVARADO, ANDREW J. (1978)
Professor, Department of Social Work Education
B.S., M.S.W., California State University, Fresno; Ed.D., University of California, Los Angeles.

AMARAL, JACINTA (1988)
Associate Professor, Department of Foreign Languages
B.A., Wells College; M.A., New York University; Ph.D., Yale University.

AMARAL, PEDRO (1987)
Associate Professor, Department of Philosophy
B.A., Ph.D., University of Pittsburgh.

ANDERSON, AUDREY SPRINGS (1987)
Dean, Division of Extended Education
B.S., M.S., Ed.D., Northern Illinois University.

ANDERSON, DAVID C. (1966)
Professor, Department of Management
B.S., M.S., West Virginia University; D.B.A., Georgia State University.

ANDERSON, LAWRENCE L. (1971)
Professor, Department of Art
B.A., M.A., San Jose State College.

ANDERSON, R. GENE (1970)
Professor, Department of Speech Communication
B.A., M.A., Baylor University; Ph.D., University of Colorado.

ANDERSON, RANDY J. (1982)
Professor, Department of Information Systems and Decision Sciences
B.S., M.A., Arizona State University; Ph.D., North Texas State University.

ANDERSON, TIMOTHY R. (1983)
Associate Professor, Department of Physical Education and Human Performance
B.A., M.S., Ed.D.,University of Kentucky.

ANDERSON, WILLIAM K. (1985)
Lecturer, Department of Civil and Surveying Engineering
B.S., California State University, Fresno.

ARCE, GINA (1957)
Professor, Department of Biology
B.A., M.A., George Peabody College; Ph.D., Vanderbilt University.

ARNDT, J. RICHARD (1973)
Director, Advising and Testing Services
B.S., Wheaton College; M.S., Ed.M., Oregon State University; Ph.D., Michigan State University.

ARNOLD, ROBERT F. (1968)
Professor, Chair, Department of Mathematics
B.S., M.A., California State University, Fresno; Ph.D., University of California, Berkeley.

ARPAD, SUSAN S. (1986)
Professor, Coordinator, Women's Studies Program
B.A., Tulane University; M.A., Ph.D., University of Delaware.

ASAHINA, ROBERTA REESE (1984)
Professor, Department of Journalism
B.A., M.A., University of Utah; Ph.D., Tufts University.

ATWOOD, RITA ANN (1987)
Professor, Department of Telecommunications
B.A., M.A., California State University, Fresno; Ph.D., University of Washington, Seattle.

AU, TONY M. (1985)
Professor, Department of Industrial Technology
B.S., National Taiwan Normal University; M.S., University of Wisconsin, Stout; Ph.D., University of Minnesota.

AUERNHEIMER, BRENT J. (Spring 1986)
Associate Professor, Department of Computer Science
B.A., M.S., Ph.D., University of California, Santa Barbara.

AVENT, CAROL L. (1966)
Professor, Department of Nursing
B.A., Boston University; M.S., University of Colorado.

AVENT, JON C. (1965)
Professor, Chair, Department of Geology
B.S., University of Colorado; M.S., Ph.D., University of Washington.

AVERY, GEORGE E. (1959)
Professor, Department of Teacher Education
B.S., Colorado State University; Ed.D., University of Maryland.

AYCOCK, LINNEA M. (1983)
Associate Professor, Department of English
B.A., M.A., California State University, Fresno; Ph.D., University of Iowa.

AYER, SALLY L. (1971)
Professor, Department of Physical Education and Human Performance
B.A., Colorado State College; M.A., Northern Arizona University; Ed.D., University of Utah.

BACA, MARIO L. M. (1983)
Associate Professor, Department of Teacher Education
B.S.Ed., University of New Mexico; M.A., University of Washington; Ph.D., University of New Mexico.

BACKER, RICHARD L. (1989)
Director, Admissions, Records, Evaluations
B.S., Slippery Rock State College; M.S. Long Island University; Ph.D., Kent State University.

BACON, CONSTANCE C. (1983)
Associate Professor, Department of Speech Communication
B.S., Georgia State University; M.A., Auburn University; Ph.D., University of Oklahoma.

BADERTSCHER, LYNN M. (1989)
Lecturer, Department of Speech Communication
B.A., M.A., California State University, Fresno.

BADR, SAYED A. (1970)
Professor, Department of Plant Science and Mechanized Agriculture
B.S., Ain-Shams University (Egypt); M.S., Ph.D., University of California, Davis.

BAKER, DENNIS M. (1984)
Professor, Chair, Department of Accountancy
B.S., California State University, Fresno; Ph.D., University of California, Los Angeles; C.P.A.

BALDIS, BETTE J. (1971)
Associate Professor, Department of Communicative Disorders
B.Ed., M.S., Illinois State University.

BALLARD, O. DUANE, JR. (1968)
Professor, Department of Physical Education and Human Performance
B.S., M.S., Brigham Young University; R.P.T., Stanford University.

BALTRA, ARMANDO (1987)
Associate Professor, Department of Linguistics
B.A., University of Chile; M.S., Edinburgh University; Ph.D., Catholic University of Sao Paulo (Brazil).

BARABAS, ARTHUR H. (1983)
Professor, Department of Geology
A.B., Princeton University; M.Phil., Ph.D., Yale University.

BARTA, JOHN M. (1968)
Professor, Department of Foreign Languages
B.A., M.A., Ph.D., University of California, Los Angeles.

BASDEN, BARBARA H. (1973)
Professor, Department of Psychology
B.A., College of Idaho; Ph.D., University of California, Santa Barbara.

BASDEN, DAVID R. (Spring 1969)
Professor, Department of Psychology
B.A., College of Idaho; Ph.D., University of California, Santa Barbara.

BASS DE MARTINEZ, BERNICE (1987)
Professor, Chair, Department of Teacher Education
B.A., M.A., University of Northern Colorado; Ph.D., University of Florida.

BATHURST, LEONARD H., JR. (1954)
Professor, Department of Teacher Education
B.A., M.Ed., Ed.D., Pennsylvania State University.

BATISTA, JUAN C. (1986)
Associate Professor, Department of Agricultural Economics
B.A., California State University, Humboldt; M.S., Ph.D., Cornell University.

BATTENBURG, JOSEPH R. (1981)
Professor, Department of Mechanical and Industrial Engineering
B.S., Andrews University; B.S.E., University of Michigan, Ann Arbor; M.S.E., University of Southern California; Ph.D., University of Wisconsin, Madison.

BEACH, PHILIP F. (1964)
Professor, Chair, Department of Political Science
B.A., University of Washington; M.A., Ph.D., Northwestern University.

BEAMAN, M. TERESA (1986)
Associate Professor, Department of Music
B.A., Yale College; M.M., Yale University School of Music; D.M.A., State University of New York at Stony Brook.

BECK, DONALD (1989)
Assistant Men's Basketball Coach, Department of Athletics
B.A., Quinnipiac College.

BEDARD, MARCIA (1987)
Associate Professor, Women's Studies Program
B.A., Saint Mary's College of California; M.A., University of San Francisco; Ph.D., The Fielding Institute.

BEECHING, ANGELA M. (1989)
Assistant Professor, Department of Music
B.M., Boston University; M.M., D.M.A., State University of New York at Stony Brook.

BELL, KAREN R. (1987)
Associate Professor, Department of Philosophy
A.B., Boston University; M.A., M.Phil., Ph.D., University of Kansas.

BENKO, STEPHEN A. (1969)
Professor, Department of History
B.D., Theological Academy, Budapest; Ph.D., University of Basel (Switzerland).

BENNETT, BOB G. (1969)
Head Baseball Coach, Department of Athletics
A.B., M.A., California State University, Fresno.

BENNINGA, JACQUES S. (1983)
Professor, Department of Teacher Education
B.A., University of North Carolina; M.A., Ph.D., George Peabody College for Teachers.

BERGMANN, RALPH H. (1979)
Professor, Department of Management
B.A., Cornell University; Ph.D., Massachusetts Institute of Technology.

BERINGSON, DONALD L. (1983)
Professor, Department of Information Systems and Decision Sciences
B.S., M.S., Ph.D., University of North Dakota.

BERLINER, ANN E. (1984)
Associate Professor, Department of Philosophy
B.A., Goddard College; M.A., California State University, Sonoma; Ph.D., Graduate Theological Union.

BERNTHAL, CRAIG A. (1988)
Assistant Professor, Department of English
B.S., B.A., Michigan State University; J.D., University of Washington; Ph.D., Michigan State University.

BERRETT, RICHARD D. (1969)
Professor, Department of Family Studies and Home Economics
B.S., M.S., Brigham Young University; Ph.D., Florida State University.

BERTKEN, KAY A. (1985)
Lecturer, Department of Information Systems and Decision Sciences
B.A., California State University, Fresno; M.A., Ph.D., Stanford University.

BEST, HAROLD L. (1970)
Director of Institutional Research; Professor, Department of Management
B.A., M.A., Ph.D., George Washington University; Licensed Psychologist.

BEST, JOEL (1970)
Professor, Department of Sociology
B.A., M.A. University of Minnesota; M.A., Ph.D., University of California, Berkeley.

BETANCOURT, RAUL (1972)
Professor, Department of Psychology
B.A., California State College, Hayward; M.A., Ph.D., University of California, Berkeley.

BETTS, CHRIS (1980)
Professor, Department of Management
B.A., M.B.A., University of New Mexico; Ph.D., University of Houston.

BEZAYIFF, DAVID A. (1986)
Director, Developmental Learning Resource Center
B.A., California State University, Fresno; M.A., University of Washington.

BHANGOO, MAHENDRA S. (1976)
Professor, Department of Plant Science and Mechanized Agriculture
B.S., Agra University; M.S., University of California, Los Angeles; Ph.D., Kansas State University.

BIACINDO, KATHRYN J. (1989)
Assistant Professor, Department of Teacher Education
B.A., M.Ed., Ed.D., Rutgers University.

BIECHLER, MICHAEL J. (1970)
Assistant Vice President for Academic Affairs — Academic Personnel; Professor, Department of Geography
B.S., Eau Claire State University; M.A., Ph.D., Michigan State University.

BIEHLER, WAYNE E. (1951)
Professor, Department of Plant Science and Mechanized Agriculture
B.S., Fort Hays Kansas State College; M.S., University of California, Davis.

BILDERBACK, D. LOY (1962)
Professor, Department of History
B.A., M.A., University of Kansas; Ph.D., University of Washington.

BILLINGS, ROBERT S. (1957)
Professor, Department of English
B.A., University of New Hampshire; M.A., Boston University; Ph.D., State University of Iowa.

BIRELINE, ARLENE (1985)
Director, Reentry Program
B.A., California State College, Stanislaus; M.A., Chapman College.

BISSONNETTE, PAUL E. (1972)
Assistant Vice President for Administration and External Relations; Director of Physical Development and Planning
B.A., San Diego State University; M.P.A., University of San Francisco.

BJERK, ROGER C. (1969)
Professor, Department of History
B.A., Pacific Lutheran University; M.A., Ph.D., Washington State University.

BLACK, KELLY J. (1978)
Professor, Department of Information Systems and Decision Sciences
B.A., Brigham Young University; M.A., Ph.D., University of Southern California.

BLACKERBY, BRUCE A. (1963)
Professor, Department of Geology
B.A., University of California, Riverside; Ph.D., University of California, Los Angeles.

BLAKELEY, DONALD N. (1989)
Lecturer, Department of Philosophy
B.A., California State University, Fresno; M.A., Ph.D., University of Hawaii.

BLANTON, RONALD L. (1965)
Professor, Department of Industrial Technology
B.A., M.A., California State University, Fresno.

BLIELE, NANCY (1987)
Physician
B.A., University of California, San Diego; M.P.H., University of California, Berkeley; M.D., University of California, San Francisco.

BLOMGREN, GLEN H. (1962)
Professor, Department of Industrial Technology
B.A., M.A., California State University, Fresno; Ed.D., University of California, Los Angeles.

BLOOM, MELANIE M. (1985)
Assistant Professor, Department of Speech Communication
B.A., Wayne State University; M.A., Ph.D., Ohio University.

BLOOM, VINCENT L. (1970)
Professor, Department of Speech Communication
B.A., Bethel College; M.A., Colorado State College; Ph.D., Ohio University.

BLUEM, JOHN R. (1984)
Assistant Soccer Coach, Department of Athletics
B.A., Hartwick College; B.S., Ohio State University.

BLUESTEIN, GENE (1963)
Professor, Department of English
B.A., Brooklyn College; M.A., Ph.D., University of Minnesota.

BLUESTONE, SYDNEY (1963)
Professor, Department of Chemistry
B.S., Brooklyn College; Ph.D., Rutgers University.

BOCHIN, HAL W. (1969)
Professor, Department of Speech Communication
B.S., John Carroll University; M.A., University of Wisconsin; Ph.D., Indiana University.

BOCHIN, JANET S. (Spring 1973)
Associate Librarian, Acquisitions Department
B.M., M.L.S., University of Texas at Austin; M.A., California State University, Fresno.

BOHNSTEDT, JOHN W. (1956)
Professor, Department of History
B.A., Michigan State University; M.A., Ph.D., University of Minnesota.

BONHAM, CLIFFORD V. (1964)
Professor, Department of Social Work Education
B.A., M.S.W., University of California, Berkeley.

BOTTINI, DAVID M. (1983)
Lecturer, Department of Art
B.A., M.A., California State University, San Jose.

BOWDEN, SHIRLEY J. (1968)
Professor, Department of Enology, Food Science, and Nutrition
B.S., University of California, Los Angeles; Dietetic Internship, Johns Hopkins; M.S., California State University, Fresno; Ph.D., Oregon State University; Registered Dietitian.

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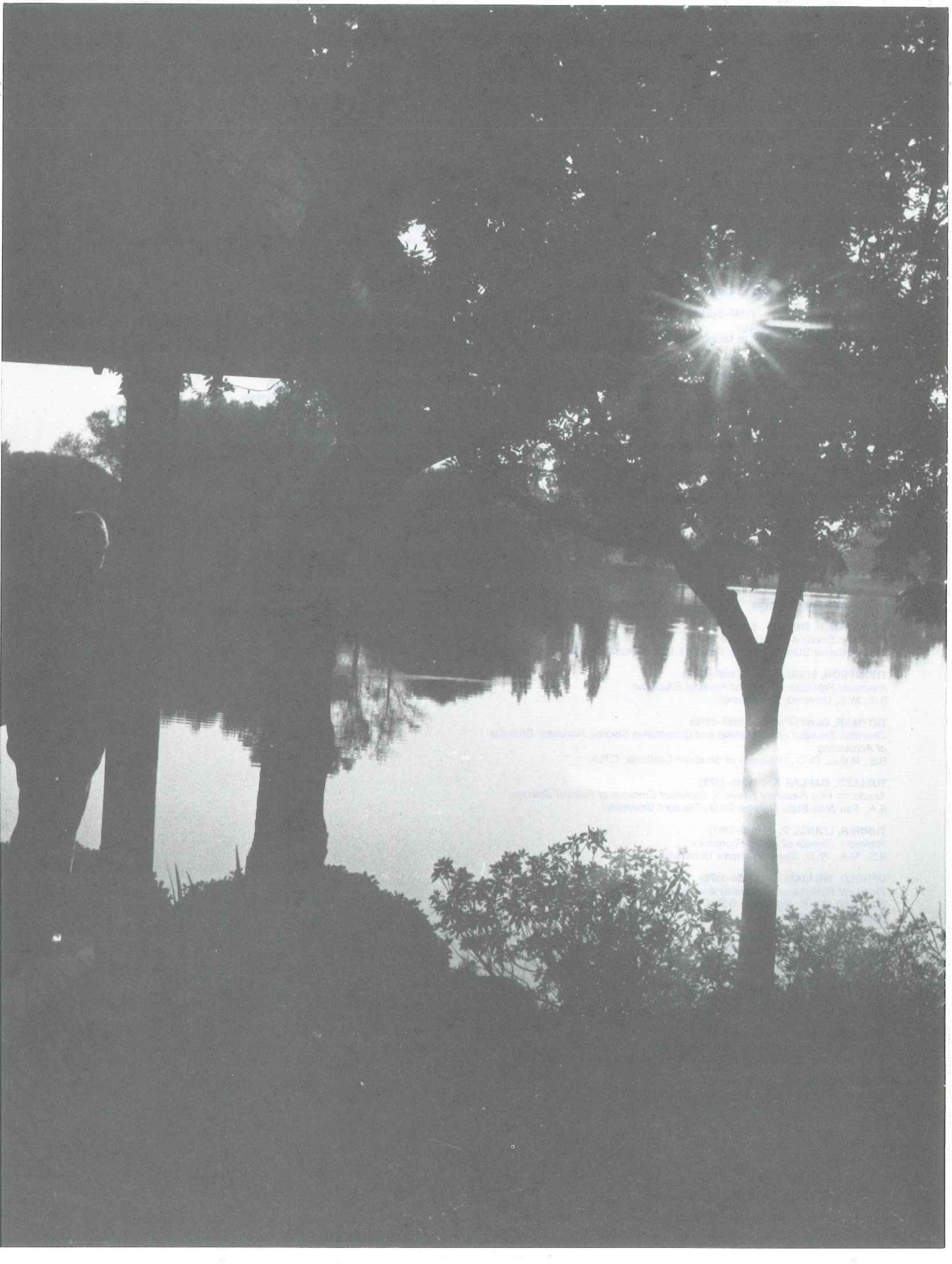

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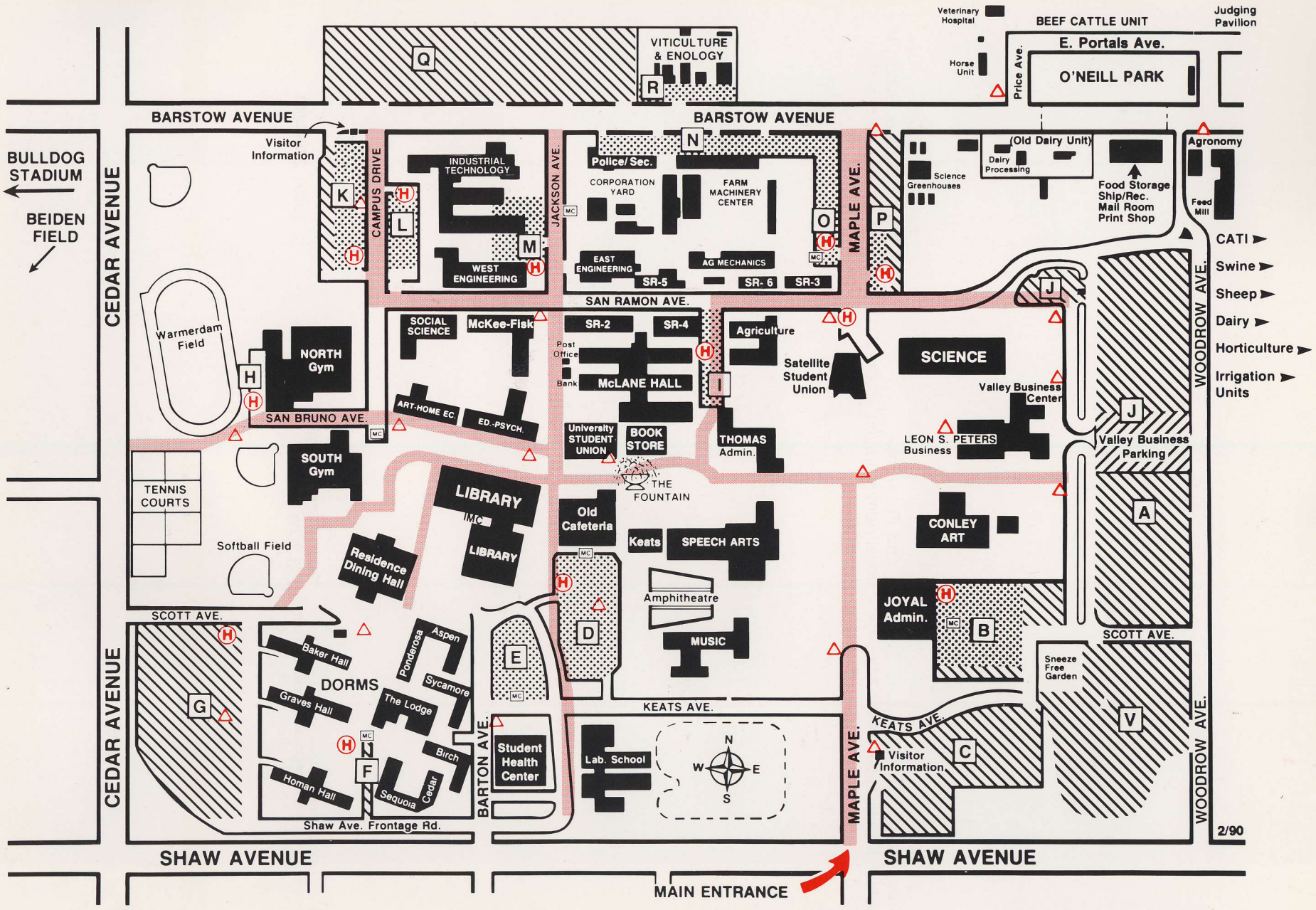

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