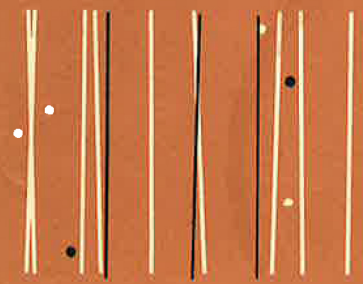
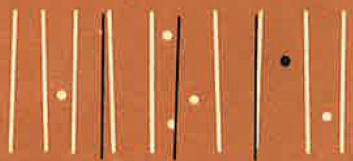


FRESNO STATE COLLEGE



General Catalog

1964 — 1965



FRESNO, CALIFORNIA



California State College

FRESNO STATE COLLEGE BULLETIN
CALIFORNIA STATE COLLEGE

VOL. XVIII MAY 1964 No 5

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General Catalog

Fall and Spring 1964-1965

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Fresno, California 93726
Telephone: 222-5161

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Courses of Instruction
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Air Science
Applied Arts
Business
Education
Engineering
Fine Arts
Letters and Science
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Physical Education—Recreation
Physical Science
Speech Arts
Faculty

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COLLEGE CALENDAR, 1964-1965

SUMMER SESSIONS 1964

Fresno	June 15-July 24, incl
Bakersfield	June 15-July 24, incl
Visalia Pre-session	July 20-24, incl
Visalia	July 25-Aug 28, incl
Fresno Post-session	July 27-Aug 28, incl

FALL SEMESTER 1964

All entering students should consult section on *Program Planning*.

Aug	17	Mon	All applications and official transcripts for new and returning students must be filed by this date to insure processing and admission. Students seeking reinstatement will be held strictly to this deadline. Students not enrolled in spring 1964 who file applications after September 8 will not be processed before September 21 and will be subject to late registration fine.
Sept	7	Mon	Holiday—Labor Day.
	9	Wed	Holiday—Admission Day.
	14	Mon	Academic year 1964-65 begins.
	14	Mon	Faculty meeting, 10 a.m.
	14	Mon	Meeting for all new undergraduate students. Men's Gym.
	14-15	Mon-Tues	Statements of residence must be filed.
	15-16	Tues-Wed	Orientation and advising for new students.
	17-18	Thurs-Fri	Registration (See *Schedule of Courses*).
	21	Mon	Instruction begins.
	21	Mon	Late registration begins ($5 fine.)
28-Oct.	2	Mon-Fri	Late registration by special permission only.
	2	Fri	Last day to file applications for degrees and credentials to be granted January 1965. Fine required for all students filing after this date.
	9	Fri	Last day to drop a course without prejudice, except by special approval.
	15	Thurs	Last day to file applications for spring semester 1965 student teaching.
Nov	13	Fri	Mid-term grade reports due from faculty.
	26-27	Thurs-Fri	Holidays—Thanksgiving.
Dec	21	Mon	Christmas recess begins.
	25	Fri	Holiday—Christmas.
Jan	1	Fri	Holiday—New Year's Day.
	4	Mon	Classes resume.
	21-28	Thurs-Thurs	Semester examinations.
	25	Mon	Last day to file with Graduate Office completed and approved theses for master's degrees to be granted January 1965.
	29	Fri	Fall semester ends.

JUNE 1964

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SPRING SEMESTER 1965

Jan	4	Mon	All applications and official transcripts for new and returning students must be filed by this date to insure processing and admission for spring semester. Students seeking reinstatement will be held strictly to this deadline. Students not enrolled in fall 1964 who file applications after January 27 will not be processed before February 8 and will be subject to late registration fine.
Feb	2	Tues	Statements of residence must be filed.
	3	Wed	Spring semester begins.
	3	Wed	Meeting for all new undergraduate students.
	4-5	Thurs-Fri	Registration (See *Schedule of Courses*).
	8	Mon	Instruction begins.
	8	Mon	Late registration begins ($5 fine).
	15-19	Mon-Fri	Late registration by special permission only.
	19	Fri	Last day to file applications for degrees and credentials to be granted June 1965. Fine required for all students filing after this date.
	26	Fri	Last day to drop a course without prejudice, except by special approval.
Mar	15	Mon	Last day to file applications for fall semester 1965 student teaching.
Apr	2	Fri	Mid-term grade reports due from faculty.
	12-16	Mon-Fri	Easter recess.
	19	Mon	Classes resume.
May	31	Mon	Holiday—Memorial Day.
June	2	Wed	Last day to file with Graduate Office completed and approved theses for master's degrees to be granted June 1965.
	2-9	Wed-Wed	Semester examinations.
	9	Wed	Fifty-fourth Annual Commencement.
	11	Fri	Academic year 1964-65 ends.

SUMMER SESSIONS 1965 (Tentative Dates)

First Session ..... June 14-July 23 incl
Second Session ..... July 26-Aug 27 incl

FALL SEMESTER 1965 (Tentative Dates)

Sept	9	Thurs	Holiday—Admission Day.
	13	Mon	Faculty meeting, 10 a.m.
	16-17	Thurs-Fri	Registration.
	20	Mon	Instruction begins.

FEB 1965

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JUNE 1965

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JULY 1965

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AUG 1965

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SEPT 1965

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BOARD OF TRUSTEES OF THE CALIFORNIA STATE COLLEGES

2930 West Imperial Highway, Inglewood, California 90303

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2930 West Imperial Highway, Inglewood, California 90303

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Assistant Chancellor, Faculty and Staff Affairs.....C. Mansel Keene

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Chico State College, Dr. Glenn Kendall, President
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San Francisco State College, Dr. Paul A. Dodd, President
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San Luis Obispo Campus, San Luis Obispo, California 93401

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Arcata, California 95521

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Kellogg-Voorhis Campus, Pomona, California

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California State College at San Bernardino, Dr. John M. Pfau, President
Mailing Address: 532 Mountain View Avenue, San Bernardino, California 92408

THE CALIFORNIA STATE COLLEGES

The California State Colleges are a unique development of the democratic concept of tax-supported public higher education for all qualified students.

Spanning the state from Humboldt County in the north to San Diego in the south, the 16 campuses of the California State Colleges (with two additional campuses in the planning stage) represent the largest system of public higher education in the Western Hemisphere, and one of the largest in the world. Current enrollment is some 135,000 full- and part-time students. The faculty and administrative staff numbers some 7000.

The individual colleges, each with a geographic, curricular and academic character of its own, offer a solid basic program in the liberal arts. Beyond this, each college is noted for its individuality in academic emphasis which makes for a diversified system. Course offerings leading to the bachelor's and master's degrees are designed to satisfy existing student interests and to serve the technical and professional manpower requirements of the state.

The California State Colleges are dedicated to rigorous academic standards. Constant striving for academic excellence is at the heart of the system. Each faculty within the system is a "teaching faculty" whose primary responsibility is the instructional process on the teacher-student level, with appropriate recognition of the necessary and constructive role of research in any institution of higher education.

Responsibility for the California State Colleges is vested in the Board of Trustees, which is appointed by the Governor, and the Board's administrative arm, the Chancellor. The Trustees and the Chancellor set broad policy for the colleges while delegating considerable independent responsibility for implementation at the college level.

Although the oldest of the colleges, San Jose State College, dates back a century, the California State College system under an independent Board of Trustees was created by the Donahoe Act of 1960. Formerly, the colleges were under the jurisdiction of the State Board of Education.

Today, the California State Colleges are in a particularly dynamic period of their development. Prior to World War II, there were seven State Colleges with a peak total enrollment of some 13,000. Since 1947, nine new campuses have been developed and two more are scheduled to begin operation within the next two years. Enrollment in the system is expected to reach 180,000 by 1970.

FRESNO STATE COLLEGE ADVISORY BOARD

A group of twelve citizens of Fresno and vicinity appointed by the Trustees of the California State Colleges as an advisory body to the administration of Fresno State College.

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Dennis B. Wheeler
Melville E. Willson

Arnold E. Joyal, Executive Secretary

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Fresno State College Association, Inc.
Fresno State College Foundation
Fresno State College Agricultural Foundation

Director of Related Educational Activities ..... Earle L. Bassett
Assistant Manager for Association Activities ..... Earl Whitfield

COLLEGE ADMINISTRATION, 1963-1964

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Vice President—Irwin O. Addicott
Director of Public Relations—Arthur H. Margosian
Administrative Research Assistant—Rose Shamlin
Executive Dean—Orrin D. Wardle

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Director of Teacher Education—Richard K. Sparks
Coordinator of Instructional Media Center—Leonard H. Bathurst, Jr.
Television Coordinator—Edwin H. Lombard
Coordinator of Computer Center—John T. Emerson
Dean of Arts and Sciences—Herbert H. Wheaton
Dean of Graduate Studies—Phyllis W. Watts
Coordinator of Graduate Studies—Arnold M. Cooper
College Librarian—Henry M. Madden

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Associate Dean of Students (Activities—Housing)—Gordon Wilson
Activities Adviser—Martha J. Miller
Housing Coordinator—Charles L. Wheeler, Jr.
Associate Dean of Students (Counseling—Testing)—Melvin A. Angell
Test Officer and Coordinator of Faculty Advising—Deryle K. Allen
Psychometrist—Beverly J. Aldrich
Financial Aids Coordinator—Kenneth E. Lewis
Counselor—Viola A. Davis
Counselor—Evelyn Wright
Associate Dean of Students (Admissions—Records) and Coordinator of Relations with Schools—Harry E. Jones
Admissions Officer—William G. Pollock
Registrar—F. Sheldon Hindman
Evaluations Supervisor—Caroline Ryles
Director of Placement—Harold D. Jones
Placement Supervisors—Gladys Ekizian, Vivian Jordan
Director of Health Services—Marvyn S. Schwartz, M.D.
Physician—Lloyd A. Hall, M.D.
Supervising Nurse—Anna Edwards

EDUCATIONAL SERVICES AND SUMMER SESSIONS

Dean of Educational Services and Summer Sessions ..... Edward M. Spencer
Director of Bakersfield Center ..... Leo P. Varner
Coordinator of Extension ..... Arne J. Nixon

FARM SCHOOL

Dean of Farm School ..... Lloyd Dowler
Farm Manager ..... George F. Ilg

BUSINESS MANAGEMENT

Business Manager ..... Carl Levin
Administrative Assistant ..... Henry Roberts
Accounting Officer ..... George T. Weybright
Purchasing and Property Officer ..... Ralph D. Koerber
Personnel Officer ..... William M. Coughran
Housing Manager ..... Lavon C. Erickson
Superintendent of Buildings and Grounds ..... Ashton H. Shields
Chief Engineer ..... Marion Mason

SUDAN EDUCATIONAL PROJECT

Chief of Party ..... Ralph F. Evans
Campus Coordinator ..... Kenneth L. Meeks

DIVISION HEADS AND DEPARTMENT CHAIRMEN, 1963-1964

Agriculture Division	Lloyd Dowler
Agriculture Mechanics Department	Clarence D. Jensen
Animal Science Department	Jesse T. Bell
Plant Science Department	Wayne E. Biehler
Air Science Division	Major Eugene C. Watkins
Applied Arts Division	Horace O. Schorling
Home Economics Department	Louise W. Porch
Industrial Arts Department	Horace O. Schorling
Business Division	McKee Fisk
Education Division	Richard K. Sparks
Elementary Education Department	Glenn F. Leslie
Secondary Education Department	Stephen V. Ballou
Advanced Professional Studies Department	Morris L. Bigge
Health Education Department	Henry F. Fricker
Engineering Division	Thomas H. Evans
Fine Arts Division	Ralph C. Rea
Art Department	John Ed Herbert
Music Department	Ralph C. Rea
Letters and Science Division	Herbert H. Wheaton
Anthropology-Sociology Department	William C. Beatty, Jr.
Criminology Department	Frank M. Boolsen
Economics Department	Richard C. Spangler
English Department	Russell E. Leavenworth
Foreign Language Department	Edgar A. List
History Department	Francis A. Wiley
Journalism Department	Paul V. Sheehan
Philosophy Department	Jack A. Pitt
Political Science Department	Karl E. Buckman
Social Work Department	Thomas M. Brigham
Life Science Division	Lloyd G. Ingles
Biology Department	Lloyd G. Ingles
Nursing Department	Fannie L. Gardner
Psychology Department	Edward V. Tenney
Physical Education—Recreation Division	Cecil N. Coleman
Physical Education Department—Men	Ara Hairabedian
Physical Education Department—Women	R. Elaine Mason
Physical Science Division	Frederic A. Scott
Chemistry Department	Warren R. Biggerstaff
Geography Department	Chester F. Cole
Geology Department	George M. Stanley
Mathematics Department	Anthony E. Labarre, Jr.
Physics Department	Frederic A. Scott
Speech Arts Division	John W. Wright

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College Librarian	Henry M. Madden
Librarian IV	Robert T. Utterback, Virginia C. West
Librarian III	Gary B. Kellogg, Elizabeth A. Landrum, Lillie A. Parker, Ralph E. Stierwalt, Raymond F. Wood
Librarian II	Sara C. Berry, Ruth O. Dahlgren, Jean L. Froscher, Ronald J. Harlan, Stephanie Hillman, Erland L. Jacobsen, Ruth E. Leerhoff, George H. Ollikkala, Robert C. Page, Edith M. Quibell, Lois M. Scarboro, S. Louise Stull, Grace T. Waibel, Norman D. Webster, J Printise Womack
Librarian I	Ann Hopping



FRESNO STATE COLLEGE
Art-Home Economics Building


FRESNO STATE COLLEGE
Science Building



FRESNO STATE COLLEGE
Memorial Court and Administration Building


FRESNO STATE COLLEGE
Library

FRESNO STATE COLLEGE

GENERAL INFORMATION

FUNCTIONS

The primary function of Fresno State College, as one of the California State Colleges, is to provide undergraduate and graduate instruction through the master's degree, in the liberal arts and sciences, in applied fields and in the professions, including the teaching profession. Faculty research is authorized to the extent that it is consistent with the primary function of the college and the facilities provided for that function.

At Fresno State College an effort has been made to provide the type of undergraduate and graduate program which will develop competence in an individual as a student, a citizen, and an effective leader. The program of studies provides curricula, including general and specialized courses, designed to prepare students in a wide variety of fields. The program offers educational opportunities in preparation for the professions and for many occupations, including managerial and technical positions in agriculture, industry, business, and government. In its service role for the region, the college provides continuing and in-service education at an advanced level, serves as a consultant center for public agencies, school systems, and private business enterprises, and conducts research consistent with its functions.

HISTORY

The broad nature of the educational opportunities and services offered by Fresno State College comes naturally from its twofold origin. In 1910 the first junior college in California was established in Fresno. The following year a state normal school was authorized. These two institutions—one providing general and vocational training and the other preparation for teaching—were directed by a single administration. As they grew, they were temporarily separated; but in 1921, with the expansion of the courses for teachers to four years with authority to grant the bachelor of arts degree, the two kinds of college service were again united. In 1935 the official name was changed to Fresno State College, with authority to carry on various types of college work leading to bachelor's degrees, either with or without courses required for teaching credentials. In 1946 the college was authorized to offer a fifth year of graduate work leading to the general secondary credential. Three years later in 1949 came another important advancement in the academic program of the college with the authorization for granting the master of arts degree for teaching service. In 1955 this authorization was extended to include the occupational master of science degree, and in 1958 it was further extended to permit a liberal arts emphasis in the master of arts degree. In 1961 the administration and control of the California state colleges was transferred from the State Board of Education to the Trustees of the California State Colleges.

In its rapid development during recent years the college has emphasized not only a variety of offerings suited to the special needs of its students, but also the personal attention and guidance which help students to gain a clear understanding of their own abilities and interests and to select appropriate programs.

Serving a population of approximately one million, Fresno State College has had most favorable conditions for its development and for meeting the needs of the young people of the San Joaquin Valley.

NATIONAL RATING AND ACCREDITING

The college is accredited by the California State Board of Education and the Western Association of Schools and Colleges. It is a member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary

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teachers, secondary teachers, and school service personnel, with the master's degree as the highest degree authorized; accreditation for the school service personnel category is limited to elementary principals and supervisors, secondary principals and supervisors, and guidance workers. The Business Division is a member of the American Association of Collegiate Schools of Business. The Chemistry Department is approved by the American Chemical Society. The Nursing Department is accredited by the National League for Nursing and the California State Board of Nursing Education and Nurse Registration. The Journalism Department is accredited by the American Council on Education for Journalism; its news editorial sequence is specifically accredited by the Council. Students who transfer to other institutions will receive credit for courses satisfactorily completed.

BUILDINGS AND FACILITIES

Fresno State College is located on a new 1410-acre site at Cedar and Shaw Avenues in the northeast section of the City of Fresno. The major buildings on the new campus are administration, agricultural classroom, agricultural mechanics, art-home economics, bookstore, business, cafeteria, education-psychology, engineering, home management cottage, industrial arts, laboratory school, library, men's gymnasium, music, science, social science, speech arts, student health service, and women's gymnasium. A large amphitheatre is located between the speech arts and music buildings to accommodate commencements, convocations, and other large assemblages. Three residence halls are located on the campus. Frank A. Homan Hall houses 208 men; Mary Baker Hall and George West Graves Hall house 416 women. Plans call for the construction of other new buildings and additions to existing buildings to meet the enrollment increases anticipated during the next several years.

The major academic buildings on the Shaw Avenue Campus, first occupied during the 1953-1954 school year, are located within a 220-acre area. These modern buildings are surrounded by beautiful trees, shrubbery, flowers, and broad expanses of grass. A lovely fountain graces the handsome Memorial Court in the center of the campus. Walkways, bordered by occasional benches, interlace the campus, providing for a free flow of student traffic between the buildings. Parking areas are located within and around the fringe of the 220-acre area.

The College Farm consists of 1190 acres and 43 farm buildings which together with livestock and equipment provide one of the most modern and best equipped agricultural plants in the west.

Located, in the vicinity of the former campus, approximately five miles from the Shaw Avenue Campus are Ratcliffe Stadium, on Blackstone and University Avenues, and the University Avenue Extension Center, at Van Ness and University Avenues.

The college makes special arrangements for use of facilities in Bakersfield for the Bakersfield Center and in other valley communities for summer session and extension programs.

LIBRARY

A functional building, completed in 1956, houses the College Library. The collections include over 180,000 catalogued volumes, 85,000 government publications, 23,000 pamphlets, 30,000 maps, and 17,000 pictures and prints. Over 1,600 periodicals are received on subscription. Special collections include the Roy J. Woodward Memorial Library of Californiana and the College Archives. A collection of 5,000 volumes in the College Laboratory School Library provides a model library for an elementary school. The Curriculum Library, with over 17,000 volumes, contains material of value to students of education. The library building accommodates 636 readers. All students have free access to the resources of the Library. Professional librarians are available to assist students in their use of library materials. The Library is open seventy-seven hours a week, during hours posted at the entrance to the building.

SCHEDULE OF FEES

Note: Fees are subject to change upon approval by the Trustees of the California State Colleges.

For each student enrolled for more than 6 units:	
Materials and service fee, per semester	$38.00
Association fee and health service fee, per semester (not a state fee)	12.00
Total, per semester (California resident)	$50.00
For each student enrolled for 6 units or less:	
Materials and service fee, per semester	19.50
Nonresident * tuition fee, per semester *in addition to other fees:*	
Each nonresident student enrolled for 15 units or more	250.00
Each nonresident student enrolled for less than 15 units, per unit	17.00
Each nonresident foreign student enrolled for 15 units or more	127.50
Each nonresident foreign student enrolled for less than 15 units, per unit	8.50
Note: Auditors pay the same fees as students registered for credit.	
Extension, per unit:	
Lecture or discussion course	10.00
Activity course	13.00
Science laboratory course	20.00
Summer session courses, per unit	14.25
Other Fees:	
Application for admission fee	$5.00
Diploma fee (not a state fee)	3.00
Transcript of record (no charge for first copy)	1.00
Thesis binding fee, 4 copies (not a state fee)	15.00
Additional copies, per copy	3.75
Organ practice, per semester	10.00
Studio lesson, per lesson	1.00 to 6.00
Credential fee (*collected for State Department of Education, $8 each credential*)	
Penalties:	
Check returned for any cause	$2.00
Late registration (in addition to materials and service fee)	5.00
Change of program after final filing date	1.00
Failure to meet administratively required appointment or time limit	2.00
Late filing of student programs	2.00
Late filing of application for degree or credential	2.00
Lost or broken items, cost or $1.00 if cost is less than $1.00.	
Lost library items	cost plus 1.00
Residence Hall Rates:	
Room and board, per semester each student	$415.50
(Includes room, three meals per day Monday through Friday, and breakfast and dinner on Saturdays and Sundays during the time college is in session; parking space; accident, sickness and hospitalization insurance.)	
Parking Fees:	
Nonreserved spaces	
Student enrolled for more than 6 units, per semester	$13.00
Student enrolled for 6 units and less, per semester	6.00
Summer session—Fresno Campus Session	5.00
Reserved spaces	
Each semester	22.50
Summer session—Fresno Campus Session	7.50

* 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 the last day a student may register without paying a late registration fee. The Fresno State College attorney on residence matters has sole authority to make resident determinations.

REFUND OF FEES

Refund of Registration Fees

After a student makes a formal withdrawal through the Student Records Office, a refund of a portion of the *materials and service fee* may be made if written application for refund is filed not later than two weeks following the day instruction begins for the term. A student shall make the application personally if he is able to do so. If, in the opinion of the administration, a student is unable to make the application personally, the parents or guardian of the student who is a minor, or the duly authorized representative of the student who is of the age of majority may make the application.

The amount of the refund will be determined by the Business Office by deducting the cost of materials and services used, plus $2 for registration costs. A full refund may be made to a student who is unable to continue a course, because of a college regulation or because of compulsory military service, at any time prior to the date when the student receives any academic credit for any course or courses for which he is registered. The *late registration fee* is not refundable. If a student reduces his units to fall within a lower fee category within the first two instructional weeks of the session, makes a formal change of program through the Student Records Office, and files a written application for refund within this time limit, the differential may be refunded except for the cost of materials and services used, plus $2 to cover registration costs.

The same withdrawal and application for refund procedure applies for the *nonresident tuition fee* except that the time limit is different. Within the first week of the session, a full refund may be made. 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.

Refund of 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 he files with the Business Office a written application for refund and returns all documents issued to him by the college which evidence his right to use the parking facility including any parking permit, stickers, and decals so issued. If any of the foregoing items are attached to a vehicle and the vehicle is presented to the college for removal of the attached item by or under the direction of the State, such presentation and removal shall constitute return of the attached items.

Nonreserved Space Fee Refund. Beginning with the first day of instruction, 75 percent of the nonreserved 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 the semester.

Reserved Space Fee Refund. The total of the following amounts is refunded for the remaining time for which payment was made for reserved space: $5 refund for each complete calendar month; $2.50 for more than 15 days of a calendar month; no refund for 15 days or fewer of a calendar month.

(For refund of fees during summer sessions consult the Business Office.)

Refund of Other Fees

The schedule of refunds for the *association fee and the health service fee* is set annually. Refunds are dependent upon the length of time between the opening of the semester and application for refund. Application must be made and student body card turned in to the Association Office.

The *extension tuition fee* may be refunded upon formal withdrawal and the filing of written application on the official form provided by the Extension Office prior to the fourth meeting of the class. The *late registration fee* is not refundable.

A partial refund of the *summer session* fee may be made, if applications for withdrawal from classes and return of fees are filed within required time limits. See the *Summer Session Bulletin.*

REGULATIONS AND PROCEDURES

ADMISSIONS

Admissions standards in the California State Colleges are prescribed by the Trustees of the California State Colleges and are stated in the *California Administrative Code, Title 5, Education* (Section 40600-41200), which provides a uniform pattern of admissions regulations for all the colleges. A student enrolling in any semester, other than summer session or extension or as an auditor without credit, must meet the standards for admission contained in this subchapter.

ADMISSION OF FRESHMEN

A high school graduate must meet one of the following requirements, (a) or (b). All freshman applicants must also complete the required entrance examination, the College Entrance Examination Board Scholastic Aptitude Test (SAT), in order that their applications be considered.

(a) The applicant must have earned 14 or more semester grades of A or B in subjects taken during the last three years of high school, other than physical education, military science, and remedial courses. Six of the 14 grades must be in college preparatory subjects selected from one or more of the following fields (no specific course pattern is required): (1) English, including speech, drama, and journalism, other than activity courses; (2) foreign languages; (3) mathematics; (4) natural sciences; (5) social sciences.

(b) The applicant must have earned 10 or more semester grades of A or B in subjects, taken during the last three years of high school, other than physical education, military science, and remedial courses, and have achieved a score at or above the thirtieth percentile on national college freshmen norms of a standard college aptitude test. Fresno State College requires students to submit the results of the College Entrance Examination Board Scholastic Aptitude Test (SAT).

Changes in Freshman Admission Effective Fall of 1965

The California State Colleges will change admission requirements for entering freshmen in the fall of 1965. High school students who are planning to apply for admission to a state college at that time should consult with the college and high school counselors about the new freshman admission standards during the 1964-65 academic year.

TECHNICAL AGRICULTURE PROGRAM

High school graduates may be admitted to the technical agriculture program in accordance with provisions listed in the *Agriculture Division*.

ADMISSION OF UNDERGRADUATE TRANSFERS

An applicant who meets the requirements for admission with freshman standing and who has earned credit in one or more accredited junior colleges, colleges, or universities may be admitted if he has a grade point average of 2.0 (grade C on a five-point scale) or better in the total program attempted at such colleges or universities and is in good standing at the last college or university attended.

An applicant who does not meet the requirements for admission with freshman standing must, as a condition for admission, have earned 60 or more semester units of college credit with a grade point average of 2.0 or better in the total program attempted and must be in good standing as noted above.

All entering undergraduate students, except foreign students whose native language is not English, are required to submit scores on the College Entrance Examination Board Scholastic Aptitude Test (SAT).

A maximum of 70 semester units earned in a junior college may be applied toward the degree, with the following limitations: no upper division credit may be allowed for courses taken in a junior college; no credit may be allowed for professional courses in education taken in a junior college, other than an introduction to education course.

An applicant who was ineligible for freshman admission may be admitted if his major is such that 60 units of work appropriate to state college degree requirements in the particular major are not offered by the accredited degree-granting institution from which he seeks to transfer, and if he meets all of the following standards:

(a) He has earned college credit in one or more accredited degree-granting colleges or universities and attained a grade-point average of 2.0 (grade of C on a five-point scale) or better in the total program attempted at such colleges or universities.

(b) He was in good standing at the last accredited college or university attended.

(c) In the opinion of the proper college authorities, he can succeed in the major in the state college.

ADULT ADMISSION TO SPECIAL STATUS

An applicant who has attained the age of 21 years and is not a high school graduate may be admitted to the state college as an adult special student, provided that he demonstrates to the proper college authorities ability to profit from college work.*

ADMISSION TO GRADUATE STUDY

The *California Administrative Code, Title 5, Education,* provides as follows:

41000. Admission With Graduate Standing: Unclassified. (a) For admission with graduate standing as an unclassified graduate student, a student shall have completed a four-year college course and hold an acceptable baccalaureate degree from an accredited institution; or shall have completed equivalent academic preparation as determined by the appropriate college authorities. (b) Admission to a state college with graduate standing does not constitute admission to graduate degree curricula.

41001. Admission to Graduate Degree Curricula: Classified. A student who has been admitted to a state college under Section 41000 may, upon application, be admitted to an authorized graduate degree curriculum of the college as a classified graduate student if he satisfactorily meets the professional, personal, scholastic, and other standards for graduate study, including qualifying examinations, as the appropriate college authorities may prescribe. Only those applicants who show promise of success and fitness will be admitted to graduate degree curricula, and only those who continue to demonstrate a satisfactory level of scholastic competence and fitness, as determined by the appropriate college authorities, shall be eligible to continue in such curricula. Students whose performance in a graduate degree curriculum is judged to be unsatisfactory by the authorities of the college may be required to withdraw from all graduate degree curricula offered by the college.

For information regarding admission to graduate standing and candidacy for the master's degree, see *Degrees and Credentials—Master's Degrees.*

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.

Graduates—Students who have a bachelor's degree or higher.

AUDITORS

Students enrolling as auditors only, must be cleared by the Admissions Office. Written permission of instructors must also be secured and filed at registration before enrolling as an auditor for one or more courses without credit. Auditors must register in the usual way and pay the same fees as would be charged if the courses were taken for credit. Credit for courses audited will not subsequently be granted on the basis of the audit. Students enrolled for credit in any class may not transfer to audit status after the first six weeks. Students enrolled in audit status only may not transfer to credit status without completing admission procedures; this must be done within the first three weeks.

ADMISSION PROCEDURE

Applications for the fall semester are accepted beginning March 1 and applications for the spring semester are accepted beginning October 1.

For undergraduate admission to Fresno State College a student must:

1. Submit an application on a form provided by the Admissions Office and pay the $5 application fee to the College Business Office.
2. Request institutions formerly attended to forward 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.
3. Take the Scholastic Aptitude Test of the College Entrance Examination Board and have copy of the results sent to the college Admissions Office.
4. Take any additional entrance examinations required.
5. Veterans must, in addition, file with the Admissions Office a copy of Notice of Separation from military service.

Application for admission should be filed at least one month prior to the beginning of the semester for which the student plans to enroll. The college cannot assure approval of applicants to register or provide evaluations for applicants who file after the dates listed in the *College Calendar*. Applicants for reinstatement will be held strictly to these deadlines.

Students interested in college housing or financial aid should file special applications with the offices concerned as soon as possible in order to insure consideration.

GENERAL INFORMATION

All transcripts submitted by matriculated students are retained by Fresno State College.

Degree credit may be granted for work completed satisfactorily in another accredited institution of collegiate grade 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 is allowed toward the degree for work completed in a junior college and no upper division credit is given. Junior college credit in excess of 70 units may be used to satisfy subject requirements, but may not be applied toward the total units required for a bachelor's degree.

For limitations on extension and correspondence credit, see *Extension Classes*.

Advanced Standing Credit for Registered Nurses

Completion of the three-year course in nursing at an accredited hospital and the possession of the R.N. license will entitle the student to receive 30 units of lower division credit toward a bachelor's degree. This credit allowance will be given to registered nurses who are candidates for bachelor's degrees with majors other than nursing. Credit received from a junior college or four-year college for courses taken as part of a three-year hospital nursing program will be allowed in addition to the 30 units.

Registered nurses who are candidates for the bachelor of science degree with major in nursing must meet the requirements of the Nursing Department. See *Nursing Department.*

ADMISSION TO CREDENTIAL PROGRAMS

Admission to Fresno State College does not in itself include admission to credential programs, nor does it determine the catalog by which admission and program requirements shall be evaluated. Students planning to prepare for school service credentials, see *Education Division—Admission to Credential Programs.*

RECOMMENDED HIGH SCHOOL PREPARATION

The following high school work is advisable as minimum preparation for any college program leading to a bachelor's degree.

English	3 year credits
Algebra	1 year credit
Geometry	1 year credit
One foreign language	2 year credits
American history or American history and civics	1 year credit
Other junior or senior social science	1 year credit
Botany, chemistry, physics, physiology, or zoology	1 year credit

Since certain fields of study require high school preparation in definite subjects, the student should consult the requirements indicated in the field of his choice.

In college fields such as natural science, mathematics, social science, and humanities a maximum number of high school credits should be obtained in appropriate subjects in English, mathematics, science, and foreign languages.

ENTRANCE EXAMINATIONS

The examinations listed below are required of entering undergraduate students as a part of their admission procedure.

College Aptitude Test: All entering undergraduate students, except foreign students whose native language is not English, are required to submit scores on the College Entrance Examination Board Scholastic Aptitude Test (SAT). This test may be taken at any testing center established by the Educational Testing Service on any date listed in its published schedule. In general, students should arrange to take the test at least a month before entering college. Information may be obtained from local high schools and colleges regarding test schedules, application for test reservations, and payment of the $5 registration fee for the test charged and collected by the Educational Testing Service. Students may write the College Entrance Examination Board at Box 1025, Berkeley, California, if they live in the western states; students living east of Colorado should write the Board at Box 592, Princeton, New Jersey.

Reading Examination: Because success in college is dependent upon efficiency in reading, accurate information about a student's degree of reading skill is essential to intelligent planning of his program. To provide this information, Fresno State College requires all entering undergraduate students to take a reading test. Students must file reservations for this test on forms provided by the Admissions Office upon receipt of a completed application for admission. Students whose scores in this test are significantly lower than their scores on the college aptitude test should enroll in English 6.

English Examination: Entering undergraduate students must take an objective examination which measures competence in spelling, grammar, diction, sentence structure, and punctuation. Students must file reservations for this examination on forms provided by the Admissions Office upon receipt of a completed application for admission. Following the examination students will be notified of test results

and eligibility for English courses. Transfer students who have completed freshman English or who have satisfactorily completed a course in English fundamentals equivalent to English A at another collegiate institution are excused from the examination.

English Proficiency Test for Foreign Students: A language proficiency test in English is required of all entering foreign students from non-English speaking countries. This is an objective-type examination employed to determine whether the foreign student's competence in the English language is adequate for the academic demands of college work at Fresno State College. This test must be taken prior to enrollment. Results of this test will be used for counseling with the student concerning his academic programs and referral for specialized instructional help when indicated.

Speech Test: A speech test is required of entering freshmen and of transfer students not meeting the general education speech requirement; other transfer students are encouraged to take the test. Students failing this test must take Speech Correction 1X; others are advised to enroll in Speech 21. Candidates for teaching credentials, see language usage requirement in *Education Division—Admission to Credential Programs.*

Physical and Medical Examination: A physical and medical examination is required of each regular student upon entrance as a condition of registration. Later examinations may be required at a time college authorities deem it necessary. Candidates for teaching credentials are required to secure approval of the Health Services at the time of application for admission to credential programs, and upon assignment to directed teaching. A teaching credential may not be issued to any candidate who does not possess satisfactory physical and mental health to meet fully the responsibilities of a teacher.

PROFICIENCY TESTS

Proficiency tests are required by some departments prior to students entering or being admitted to certain courses or curricula in business, chemistry, criminology, engineering, foreign language, mathematics, music, nursing, physical education, physics, and teacher education. The test results are used to program students in those studies for which they are prepared. Some of the proficiency tests are administered by the Testing Office; others are administered by the departments concerned. Consult department advisers for further information.

STATEMENT OF RESIDENCE

A Statement of Residence must be completed prior to registration for each student. Students in continuous attendance during successive semesters are not required to file statements of residence after the initial filing. Any break in attendance requires a new Statement of Residence. Students are held responsible for reporting any change in residence status. Arrangements are made so that students may complete the statements of residence during reading and English entrance examinations given on campus or during the period immediately preceding registration. These statements may not be completed by mail.

Summer session and extension students are not required to file Statements of Residence.

PROGRAM PLANNING

Freshman students should begin to plan their programs as early as possible. A first step, when practical, is to select a major. Degree requirements in each major are listed under the appropriate division and in the section on degrees and credentials.

Students will be given help in planning their programs by advisers and counselors, but the primary responsibility for meeting requirements falls on the student. The catalog should be carefully read and the proper college offices consulted for

additional information. The *Schedule of Courses* must be followed when planning a particular semester's program.

The following are among the sections students should study carefully:

Admissions
Algebra and Geometry
College Calendar
Concurrent Registration
Counseling Services
Degrees and Credentials
Entrance Examinations
Extension Credit
Fees and Expenses
Financial Assistance
Foreign Language
Foreign Students
General Education
Housing
Probation
Registration
Regulations-Procedures
Repetition of Courses
Residence Requirements
Scholarship Requirements
Statement of Residence
Upper Division Credits

TRANSFER STUDENTS

Students intending to transfer to Fresno State College should plan their programs while attending other colleges to meet curriculum requirements of this college. The general degree regulations and the requirements in the division offering the major selected should be studied for courses and sequences necessary for the degree. See provisions for transfer students in *General Education* and on transfer admission.

After admission to Fresno State College, the student will usually receive a copy of his advanced standing evaluation indicating how previous college credits have been applied toward requirements at Fresno State College. Normally, applicants meeting the deadline will receive the advanced standing evaluation before registration. Late applicants will be processed during the semester.

Each student should develop a personal folder in which he keeps his own copies of transcripts, grade cards, advanced standing evaluation, departmental check sheets, and other information pertaining to his progress toward meeting various requirements for his degree or credential. Advisers are available for assistance; however, it is the student's responsibility to be sure that he has met all requirements.

REGISTRATION

Registration is open to new students who have been formally admitted and to former students in good standing. Former students returning after an absence of one semester or more must file in the Admissions Office a form requesting readmission not less than one month prior to registration. Students seeking reinstatement will be held strictly to this deadline. Students who are returning after an absence of two semesters or less and who have attended no other institution in this interval will not be required to pay the $5 application fee for admission. The *College Calendar* lists dates of registration. Upon payment of the registration fee, registration materials are issued. Late registrants are assessed a fine of $5 and a late filing fee of $2 if materials are not filed within 48 hours. Registration is complete only when all required forms are completed and filed and all fees are paid.

Students transferring between the Fresno campus and the Bakersfield Center should notify the Admissions Office where they intend to enroll well in advance of registration; this does not apply to any Summer Session, see *Educational Services*.

SCHEDULE OF COURSES

An official *Schedule of Courses* is prepared by the Office of the Dean of Arts and Sciences each semester for publication listing general registration procedures, courses offered, hours and rooms. The schedule is available prior to registration and may be purchased through the Business Office for a nominal cost.

CONCURRENT REGISTRATION

Approval must be obtained in advance from the Admissions Office before transfer credit may be earned at another college concurrent with registration at Fresno State College.

PROGRAM RESTRICTIONS

Students planning to register for more than 17 semester units must obtain permission to carry maximum programs. In general for undergraduates, requests to take units above the maximum will be granted on the following basis: 18 semester units may be approved if the student has a 2.5 grade-point average or above (on a 4 grade-point system); 19 semester units may be approved if a 3.0 grade-point average has been maintained; any request to take 20 or more semester units will require the permission of the Dean of Students.

Enrollment in upper division courses is 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 chairman for the course concerned. Upper division credit may not be granted until a student has completed a minimum of 45 semester units. 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 college's recommendation.

Students employed as full-time teachers may not register in any one semester for a total of more than six units of course work including extension classes, unless special written permission from the employing school official is presented at the time of registration.

Credit in any course is also subject to all restrictions which may appear in the *General Catalog*. For restrictions on graduate study, see *Master's Degrees*.

PROGRAM CHANGES

Each student is held responsible for the program of courses listed at the time of registration. After the program has been filed, no changes may be made without advance application in writing on the form provided by the Student Records Office. The change is not recorded until this form is properly filled out and filed in the Student Records Office. All applications for courses added after the second week of the semester or dropped after the first six weeks incur a fine of $1.

WITHDRAWAL FROM COURSES

Withdrawal from any course after filing the program requires written application on a form provided by the Student Records Office. Withdrawal without this procedure results automatically in a failing grade. A properly filed written application for withdrawal before the end of the third week permits a student to drop a course without having the course listed on his record. A properly filed written application for withdrawal after the third week but more than six weeks before the end of the semester permits a student who is doing passing work, to drop a course with a W recorded on the transcript; otherwise the dropping of a course during this interval will be recorded as a failure. A properly filed application for withdrawal during the final six weeks of the semester permits, with the approval of the instructor, a student whose work is of passing quality to withdraw with an incomplete recorded on his transcript; if not passing, a failure (FW) is recorded. No program changes, other than complete withdrawal, may be made during the last two weeks of the semester. A fine of $1 will be assessed for application to withdraw from a course after the first six weeks of the semester, unless the student is applying for a complete withdrawal for the semester. See *Refund of Fees*.

WITHDRAWAL FROM COLLEGE

Students withdrawing from college must file written application on the form provided by the Student Records Office. Applications filed before the end of the third week of the semester will enable the student to withdraw without prejudice to his standing. Applications filed after that time will be subject to the same rules as requests to withdraw from individual courses. See *Refund of Fees.*

SCHOLARSHIP REQUIREMENTS

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.

GRADES

A—Exceptionally good.
B—Above average.
C—Average.
D—Below average.
F—Failure.
FW—Withdrawal with mark F, or failure to withdraw officially.
INC—Semester requirements incomplete, work of passing grade.
IP—Continuing work in progress, status satisfactory.
P—Passed without grade.
W—Official withdrawal.
AU—Audit.

Permission to make up an incomplete subject extends only to the end of the following semester of residence in which the course is given.

The IP and P grades may be used only in courses designated in advance by the Dean of the College. The IP remains on the transcript without penalty. Any subsequent completion of the course within the permitted time limit is shown by a later entry. Three semesters are permitted for completing a 299 course without reregistration; all other courses given IP grades operate under the same time limit as does the INC.

GRADE POINTS

For each unit of credit the student receives grade points as follows:

A—Four grade points per unit of credit.
B—Three grade points per unit of credit.
C—Two grade points per unit of credit.
D—One grade point per unit of credit.
P—Units allowed but not counted in grade-point average.
INC, IP—Neither units nor grade points counted until final grade recorded.
F, FW—Units counted, no grade points.
AU—No units or grade points allowed.

The above grade point system is effective September 1, 1964. Prior to that date the grade of INC was counted in units attempted but no grade points were allowed. Between September 20, 1956, and September 15, 1961, grade points were computed as follows: the E grade was used for Condition to be changed to D when condition was removed; P counted two grade points per unit of credit; E counted no grade points per unit. Prior to September 20, 1956, the system was: A, 3 grade points; B, 2; C or P, 1; D, E, F, FW, INC, 0. Prior to September, 1948, grades E, F, FW, and INC carried minus one grade point per unit.

An incomplete, when properly made up, will receive the units and grade points appropriate to the mark finally earned. No student may be required to repeat a course on the basis of a grade of INC.

Since September, 1941, a student may repeat any course in which a mark lower than C was received. Degree credit will be allowed only once for any course. Effective September 19, 1957, a repeated course has been counted as units attempted and is credited with the appropriate grade points earned by the repetition. Prior to the fall semester, 1957, the grade made upon repetition was accepted in place of that established earlier and units attempted were not charged. Occasionally a student wishes to repeat a course in which he earns a C. Such repetition is recorded on the transcript but is not figured in unit or grade-point totals.

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). A student is considered in good standing if he is not on probation or disqualified. See *Degrees and Credentials—Scholarship Requirements.*

PROBATION

A student will be placed on probation if either his grade-point average based on total units attempted at all colleges is below a 2.0 (C average) or his grade-point average based on all units attempted at Fresno State College is below a C average. A student will be continued on probation until his over-all and his Fresno State College grade-point average is 2.0 or better, or until he is disqualified under one of the provisions of the disqualification regulations. A student who has attempted fewer than 12 units in any college will not be put on probation solely on the basis of incomplete grades.

DISQUALIFICATION

A student will be disqualified (except a student who has attempted less than a total of 12 units) under any one of the following provisions: (a) if he fails to earn at least a 1.0 grade-point average during any one semester; (b) if he has been admitted on probation and fails to meet the conditions established at the time of admission; (c) if he is a first-semester freshman and has a grade-point deficiency of 13 or more in the first semester and fails to reduce this deficiency below 13 by the end of the next semester of attendance; (d) if he is on probation and has a cumulative grade-point deficiency of 13 or more.

REINSTATEMENT AND READMISSION

A student disqualified from the college may be reinstated only by special action and if the facts in the case seem to warrant such action. Ordinarily, consideration for readmission will not be given unless a semester has elapsed since the disqualification. Students who have been disqualified more than once may not be readmitted except under the most unusual circumstances.

A student returning after an absence and who has been disqualified after his last term of attendance must file an application with the Admissions Office by the deadlines specified in the *College Calendar.*

TRANSCRIPTS AND REPORTS

Transcript of Record. One official transcript of record is furnished each student free of charge. Each additional copy requires a fee of $1.

Transcripts of record submitted to this institution will be retained except in cases where the student fails to register.

Reports to Students. Grade reports are given students at the close of each semester. At mid-term a report is given to all students both as a verification of the student's official program and as a report of any unsatisfactory progress.

CREDIT BY EXAMINATION

Credit by examination may be earned in some cases in appropriate courses. For further information consult the department concerned.

INDEPENDENT STUDY

Independent study is offered to give the student experience in planning and outlining a course of study on his own initiative under departmental supervision. Independent study should deal either with a special interest not covered in a regular course or with the exploration in much greater depth of a subject presented in a regular course. Each department has an independent study upper division 190 course, and some departments have a graduate level 290 course. 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 over-all grade-point average of 3.0 or higher; in exceptional cases, a student with less than an over-all grade-point average of 3.0 may, with the consent of the chairman of the department involved, be permitted to register for independent study. Maximum credit of six units is allowed toward the bachelor's degree in 190 courses, and maximum credit of six units is allowed in 190 and 290 courses toward the master's degree. Credit is limited to a maximum of three units per semester. Under extraordinary circumstances more than three units of credit per semester may be allowed on petition to the department chairman.

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 chairman of the department in which the course is given. A student registers for a 190 or a 290 course the same as 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 which is filed in the department office, and an abstract of the study which is filed with the department chairman. Approval forms and copies of the current regulations may be obtained at department or division offices.

HONORS PROGRAM

The honors program is designed to serve superior undergraduate students by encouraging intensive scholarship and creative abilities. Particular stress is given to developing the student's capacity for independent pursuit of knowledge and dedicated commitment to scholarship. The honors program is open by invitation of the college to all qualified undergraduates. Invitations to participate in the program are extended on the basis of proven capacity for outstanding academic performance as indicated by faculty recommendations, scholastic record, and entrance test scores. Students who complete the requirements outlined below are eligible for special recognition at graduation, with general college honors, departmental honors, or both.

The *general college honors program* provides study in a series of specially designed colloquia which are broad in scope and may be interdepartmental. Lower division general college honors colloquia require no prerequisites other than admission to and satisfactory standing in the honors program; upper division general college honors colloquia prerequisites are generally determined by the department or departments offering the course. To graduate with general college honors a student must satisfactorily complete a minimum of 12 units of honors work and 4 honors courses. No more than 3 units of these 12 can be in departmental honors courses.

The *departmental honors program* provides specialization beyond the normal undergraduate requirements in a major field. To graduate with departmental honors a student must satisfactorily complete 9 units of departmental honors courses and 3 units of general college honors colloquia.

A student desiring to graduate with general college or departmental honors must write a major paper concerned with a topic relevant to one of his honors courses. During his last semester of honors work the student must pass an oral examination on this paper and his honors course work.

The subject matter and course titles of general college honors colloquia and departmental honors courses vary from semester to semester. See the *Schedule of Courses* for offerings in any particular semester; also see section on *Courses of Instruction—Honors Courses.*

CALIFORNIA STATE COLLEGES INTERNATIONAL STUDY PROGRAMS

State college students who qualify may participate in international study programs of the California State Colleges. Upper division and graduate students may undertake a full academic year at major institutions of higher learning in Asia, Europe, and Latin America. Academic work successfully completed at the cooperating universities abroad may be applied toward the degree requirements of state colleges with the approval of the students' major advisers and in accordance with college regulations. Detailed information may be obtained at the office of the Dean of Students or by writing to the Office of International Programs, 1600 Holloway Avenue, San Francisco, California 94132.

Fresno State College students under this program register concurrently at Fresno State College and at the host institution abroad, with credit assigned in terms of Fresno courses. Students who find appropriate study opportunities at the host institution but no counterpart course at Fresno State College may use Independent Study (190), and International Study 92, 192, 292.

Graduate Students

A Fresno State College graduate student in the above program may also use graduate Independent Study (290) and International Study 292, Projects in Study Abroad. International Study 292 is available in one- to three-unit registrations to a maximum of 18 units. Each registration requires a prearranged written plan approved by the Fresno State College instructor, department chairman, and Dean of Graduate Studies. Each registration requires one or more papers and a written or oral examination on the student's return, pending which an In Progress (IP) grade will be recorded.

FOREIGN STUDENTS

Fresno State College regularly enrolls a significant number of students from abroad. A special adviser is provided to assist them in making the most of their study in the United States. Such students should consult the Foreign Student Adviser immediately upon arrival on campus and before proceeding to a departmental adviser. (See *Regulations and Procedures—Admissions*)

Students from abroad must have sufficient understanding and proficiency in use of the English language to be successful in their course work at Fresno State College (see *English Proficiency Test for Foreign Students*). They should have sufficient funds so that they will not need employment during the first year at the college and should plan to stay long enough to take the minimum legal number of courses each semester. Students on "F" type visas must register for 12 units or more each semester.

Graduate Students

A graduate student from abroad may devote most of the first semester's study to his major field of interest and include, if appropriate, a course in English as a foreign language. In addition, a graduate student whose native language is not English and who is studying in America for the first time is required to enroll in International Study 293, Contemporary America, during his first semester at Fresno State College.

Depending on the quality of his work in the first semester and purpose for study, the graduate student may at the end of the first semester continue his study in one of the following directions: (1) If he has chosen a new field of study or if his undergraduate work was not equivalent to a Fresno State College bachelor's degree, he may complete the requirements for a bachelor's degree. (2) If he wishes to select only those courses which have greatest value for him, regardless of degree requirements, he may follow an individually planned and approved sequence of courses leading to a Certificate of Attendance. (3) If his first semester's work gives evidence of probable success in master's degree work, he may seek admission to a master's degree program. Whichever alternative the student from abroad selects, appropriate course work taken during the first semester may be accepted for credit toward this goal.

STUDENT PERSONNEL SERVICES

The student personnel services assist students in making effective use of the instructional and extracurricular programs, and in making adjustments for personal and social efficiency. The personnel services are coordinated by the Dean of Students and consist of the following departments: (1) student activities and housing supervised by the Associate Dean of Students (Activities-Housing); (2) admissions, evaluations, and records supervised by the Associate Dean of Students (Admissions-Records); (3) counseling, testing, scholarships, loans, veterans affairs, and foreign student advising supervised by the Associate Dean of Students (Counseling-Testing); (4) medical consultation, treatment, and campus sanitation supervised by the Director of Health Services; and (5) educational, business and industrial, and student placement supervised by the Director of Placement. These services are described in more detail elsewhere in this catalog.

COUNSELING

Admissions Counseling. The Admissions Office provides counseling to assist students in making application, in understanding admission requirements, and in utilizing the services of the college during the admissions process. Problems concerning evaluation of previous academic record should be directed to the Associate Dean of Students (Admissions-Records).

Vocational Counseling. The Counseling Office assists students in self-appraisal of their unique interests and aptitudes and in their search for a vocational goal for which they are best fitted. Psychological and vocational tests are used as needed. A library of vocational information is maintained, and each academic department gives vocational counseling pertinent to its field.

Educational Counseling. Each student is assigned a faculty adviser in addition to the services of the Counseling Office. The student's adviser assumes special responsibility for the student's welfare and helps him plan his academic program. The student uncertain of his choice of an academic major is assigned to a general adviser until a definite academic goal is chosen; thereafter, the adviser is a faculty member in the field of the chosen major.

The Counseling Office assists students who are failing to meet scholarship standards. Counseling and testing are designed to help students to discover weaknesses and to plan remedial measures.

Personal Counseling. The Counseling Office provides services for students with adjustment problems of a personal nature. Clinical psychologist services are available in the Counseling Office and limited psychiatric consultation is available in the Health Services Office.

Foreign Student Counseling. Special services are provided in the Counseling Office. In addition, a special adviser for foreign students supplements the regular academic advising, is available for consultation on personal problems, and coordinates the programs of campus and community organizations which serve foreign students.

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, should be reported immediately to the Counseling Office 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.

HEALTH SERVICE

The objective of the Student Health Service is to keep the student in a state of optimum health, both physically and mentally, so that he may realize to the fullest the opportunities afforded by Fresno State College. Health services are sponsored jointly by the college and the student body, the latter participating by means of a $2 health fee each semester.

The Health Service is housed in its own building, with four well-equipped doctors' suites, physiotherapy, laboratory and X-ray facilities, nurses' treatment rooms, secretarial office, and waiting room. The hours the Health Service is open each school day, during which time registered nurses are on duty and physicians are available for consultation, are posted at the entrance to the building. Many medical specialties are represented among the part-time and full-time physicians, affording a high standard of medical care.

During hours when the Health Service is closed, a qualified student may contact his own physician, in which case the Health Service will allow $5 toward the cost of one office visit or $10 toward the cost of one residence visit for any one illness. Should hospitalization for a qualified student be necessary, the Health Service will allow $10 per day for five days toward the cost of hospitalization which is not otherwise covered by insurance. In addition, an excellent student sickness and accident insurance policy is offered through the Health Service.

PLACEMENT SERVICE

The college maintains a centralized placement service which is closely integrated with the total educational process of the college, operates in cooperation with the various departments of the college, and is part of the student personnel program. Its services include educational placement, business and industrial placement, and student placement.

The placement service seeks more efficient utilization of college manpower by assisting students of the college and alumni in seeking positions which will best utilize their education, training, experience, and abilities and by aiding them in their progress toward positions of greater responsibility and personal satisfaction. It not only serves the needs of the college and its students but is vitally concerned with and directs its service toward the needs of the community, business and industry, the public school system, and to the State generally.

The specific functions of the office are to collect and make available to prospective employers personal data and confidential letters of reference of candidates; maintain a current record of employment opportunities; recommend candidates for positions at the request of employers; arrange for interviews between candidates and employers; provide guidance to candidates seeking positions; bring the needs of the employer to those who design and implement the training program; and conduct a follow-up program of candidates placed in positions.

There is no charge to students or employers for the placement service. Within the limitations of time and staff, an effort is made to assist those who seek the service; however, placement cannot be guaranteed. The college reserves the right to recommend for placement only those applicants who are adequately qualified for positions they seek.

Educational Placement

Membership in the Office of Placement is open (1) to anyone who holds or will receive a regular teaching credential in the semester prior to date of employment provided a minimum of 12 semester units of work has been completed at Fresno State College; (2) to anyone who holds or will receive a master's degree in the semester prior to date of employment provided a minimum of 12 semester units has been completed at Fresno State College; and, (3) to students who have met the Fresno State College conditions for partial fulfillment of requirements for elementary teaching under the new credential law, including student teaching.

Business and Industrial Placement

Membership in the Office of Placement is open to all graduates who desire full-time positions in agriculture, business, industry, governmental agencies, and other related fields. Seniors are urged to complete and file a personal data sheet with the Office of Placement early during the year in which they expect to graduate. Close cooperation is maintained with the various divisions and departments in the placement of candidates in these fields. Information is also available to students and former students desiring help in securing full-time employment.

Student Placement

Many students earn part of their college expenses. Entering freshmen, however, should be prepared to finance their first semester of college attendance without working; and all students should keep their outside employment to a minimum so that the total program does not endanger either health or academic achievement. Active immunization against tetanus (available through the Student Health Service) is required for any student employed on the College Farm.

Various types of employment are available. There are a number of hourly jobs in various work areas on campus for which candidates with specific abilities are sought. Other positions of a temporary nature are also available on campus. Off-campus positions consist of a variety of jobs ranging from short-term positions to those with scheduled hours for the full year. Students desiring work on or off campus should consult the Office of Student Placement. Employed students are expected in their work to reflect credit on the college.

STUDENT LIFE

College students are expected to assume the responsibilities for personal conduct appropriate to their age and maturity. Wide freedom is therefore granted by the college administration to the students as individuals and as organized groups. This responsibility has been accepted in an admirable way by the students of the college, and an unusual degree of self-government has been established. A student court has authority to deal with cases involving interpretation of student regulations or their violation. A committee on student life composed of faculty and students evaluates the student life program and makes recommendations on policy and procedure. Regulations as to satisfactory scholarship, disqualification for unsatisfactory work and related questions bearing upon college requirements are administered in accordance with college policies.

STUDENT LEADERSHIP

Membership and active participation in a reasonable number of student organizations are strongly recommended by the college. Student groups of this type are an excellent means of obtaining experience in leadership, cooperation, group action and social competence. Participation in student government is also encouraged. Many opportunities exist for participation in student affairs through election to student body and class offices, appointment to student committees, and attendance at meetings of the Student Council. Students are also offered an opportunity to serve on many faculty-student committees and association boards. These groups play an active part in recommending college policies and in conducting the affairs of the Fresno State College Association, Inc.

FRESNO STATE COLLEGE ASSOCIATION, INC.

All students enrolled for more than six units are members of the Fresno State College Association, Inc., the organization of faculty and students who have united to conduct the extracurricular affairs of the institution. A board of directors composed of faculty members and students controls the finances of the bookstore, the cafeteria, athletics, and other activities involving the collection and expenditure of student funds.

In return for a fee of $10, collected at the time of registration, each student and faculty member is issued a Fresno State College Association, Inc., membership card which permits the holder to participate in all activities of the association and admits the holder to association affairs without charge or at a reduced admission fee determined by the board of directors of the association. The principal activities supported by this fee are athletics, publications, music, drama, and cultural activities.

STUDENT PUBLICATIONS

Membership in the Fresno State College Association, Inc., entitles the holder to copies of the five major student publications. The *Collegian,* published four times each week, is the official news publication. A handbook and a directory, appearing soon after the fall semester opens, contain general information about the college and an address list of faculty and students. The college annual, the *Campus,* appears during the final month of the college year. (To obtain a copy of the *Campus,* a reservation fee must be paid at the opening of the fall semester and membership in the association must be held both semesters or one semester plus a charge of $2.50.) The college literary magazine, *Backwash,* is published once each semester at a nominal charge. All student publications distributed on campus are under the general control of an eight-member board of publications composed equally of faculty and students.

STUDENT ORGANIZATIONS

Student organizations are encouraged, and over 100 of them representing various fields of social, academic, vocational, and professional interests have been granted recognition. Nine national social fraternities and six national social sororities exist on the campus and operate group-living units. Religious interests are served by the college religious centers adjacent to the campus. These many and varied types of organizations not only offer an opportunity for social life but also make a fine contribution to the development of student leadership.

Associated Women Students

All women students are automatically members of the Associated Women Students. This organization coordinates the activities of various women's organizations on the campus and sets standards of conduct and of group living for women students.

Honor Societies

In addition to high standards of scholarship expected of all students, special recognition is given to superior scholarship. The honor society of Phi Kappa Phi, a national scholarship organization, was established at Fresno State College in 1953. Most departments of the college sponsor honor societies, many of them national in scope, in which membership is based upon superior college work. The Blue Key National Honor Fraternity for men and the Tokalon Honor Society for women offer membership to students who have good scholarship, are prominent in college activities, and who have demonstrated leadership in student affairs.

ALUMNI ASSOCIATION

The Fresno State College Alumni Association, with headquarters in the social science building, has a long record of extensive and varied activities. The association, incorporated in 1940, has established a sound financial policy. It provides annual scholarships and loans and has a program of athletic, social, and service activities. *The Bulldogger,* the official alumni magazine, is published four times a year. Annual dues are $5 a single membership; $6 joint annual membership for married couples who are alumni; and life membership is $50, which includes husband and wife. Anyone who has attended Fresno State College for one semester or more is eligible for membership. Each member shall direct twenty percent of his dues upon payment to a scholarship of his choice listed on the Alumni Scholarship Program. The scholarships provided in this program include all departments and divisions in the college.

ESTIMATE OF EXPENSES

The basic expenses for attendance at Fresno State College for a year (two semesters) for students who live away from home will range from $930 to $1125. These figures are exclusive of nonresidence tuition fee and 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.

Board and room	from $750 to $900
Materials and service fee	76
Association fee and health service fee	24
Books and supplies	80 to 125

Some students reduce the cost of board and room by cooperative living arrangement or part-time work in exchange for room and board.

FACILITIES

FOOD SERVICE

The Fresno State College Association, Inc., maintains the college cafeteria and a separate snack bar, The Roundup. The cafeteria provides regular meal services for all students and faculty five days a week and for residence hall students seven days a week during the time college is in session; The Roundup is open weekdays.

STUDENT HOUSING

College Residence Halls

The college has three modern residence halls in operation. Homan Hall houses 208 men, and Graves and Baker Halls each house 208 women. The halls are fireproof, air-conditioned buildings having study rooms, lounges, recreation rooms, and laundry facilities. Students are housed two to a room. The rooms are attractively furnished, and provide adequate study and living facilities. Linen service is provided, but students are required to furnish their own blankets and towels. Food service is provided by the college cafeteria. For information on residence hall costs, see *Fees and Expenses.*

Each hall is under the supervision of a well qualified head resident and six student assistants. Students are encouraged to take part in group living through experience in self-government and by taking part in the social and intramural programs. Women living in the halls are required to observe the residence rules of the Associated Women Students.

All students assigned space in residence halls will be required to sign an agreement to live in the halls for the entire college year. A woman student who has been assigned space in the halls for the fall semester will not be eligible to join a sorority during that semester. However, a woman residence hall applicant who has been assigned space in the halls for the fall semester and who decides to take part in sorority rush may do so provided she cancels her agreement not later than thirty days prior to registration.

Further information and applications for reservations may be obtained by writing to the Student Housing Office. Students who are applying for accommodations in the halls must also file an application for admission to the college. Conditional admission can usually be granted on the basis of a transcript of all college or high school work completed to date. For further information on admissions see *Regulations and Procedures.*

Approved Off-Campus Housing for Women

The Student Housing Office maintains a list of approved rooming and boarding houses which have been inspected and meet the college housing standards for women. A number of apartment-type units suitable for student housing have been constructed adjacent to the campus. Many of these units provide adequate super-

vision and meet other college standards for approved off-campus housing for women students. Fresno State College sororities also provide approved housing for women who affiliate with these organizations. Women living in approved housing will be required to observe the residence rules of the Associated Women Students. Arrangements for living accommodations should be made well in advance of registration. If women secure housing not on the approved list, the parent or guardian will be asked to assume full responsibility. Further information on approved housing for women may be obtained from the Student Housing Office.

Off-Campus Housing

The Student Housing Office maintains a file of available student housing as a service to students seeking living accommodations. Students are advised to make arrangements for housing as early as possible before registration. Off-campus living accommodations are provided by private homes in the area, with a limited number offering room and board. A large number of apartments are available in the area adjacent to the campus. The Housing Office will also attempt to help students interested in sharing apartments to get in touch with other students interested in similar living accommodations.

Although the college does not supervise off-campus housing, Fresno State College students living in private homes, apartments, and other types of student housing are expected to conduct themselves in a manner which will enable them to maintain desirable relations with their landlords and their neighbors.

Housing for Married Students

The college does not maintain housing facilities for married students and their families. However, some low-cost housing is available to married students and their families through application to the Housing Authorities of the City and County of Fresno, 2520 E. Clinton Avenue, Fresno, California 93703.

The Student Housing Office also maintains a file of privately owned rentals, some of which are near the campus. These private rentals range from $60 to $100 per month depending on the size and furnishings.

FINANCIAL ASSISTANCE

Undergraduate Scholarships

About 280 scholarships totaling approximately $58,000 will be available for the 1964-65 academic year. About half of these scholarships, ranging from $50 to $850, are open to new students. The average scholarship is for $160 for the year and covers the cost of material and service fees, student body fees, and a partial cost of books. Generally, upper division and specialized scholarships are in larger amounts.

Scholarships are awarded on a competitive basis, consideration being given to scholastic attainment, financial need, character, and promise. Several scholarships are available on the basis of outstanding accomplishment in specialized fields. The purpose of the scholarship program is to provide deserving students with educational opportunities that might not otherwise be possible.

Scholarship awards are announced late in May each year. Entering students should file applications with the Coordinator of Financial Aids prior to April 1st. Enrolled students should file their applications prior to March 1st. Each applicant should present two letters of recommendation from people of recognized standing in his community who are in a position to give information about the applicant's character, ability, and financial need. The applications of new students must be accompanied by transcripts of high school and all college work completed to date.

Scholarship applicants should become familiar with the yearly *Financial Aids Bulletin* which lists the various scholarships and their requirements in detail. Requests for this bulletin, for application blanks, and for other information on scholarships should be addressed to the Coordinator of Financial Aids. Students from San Joaquin Valley high schools and junior colleges may obtain information from their principals and counselors.

College Association and Foundation Loan Funds

The college maintains a number of loan funds providing financial aid to students. Loans are granted on the basis of the student's financial need, his educational program and his ability to repay his obligation to the loan fund. Most of the loan funds provide limited aid to students on an emergency basis. However, larger loans are available to senior and graduate students. These loans may be repaid after completion of the degree or credential work. The Fresno State College Association Loan Fund is administered by the Fresno State College Association, Inc. The other loan funds are held in trust by the Fresno State College Foundation. These loan funds, in general, are not available to entering students.

Applications for loans are processed through the Coordinator of Financial Aids, Fresno State College, Fresno, California 93726.

The Agricultural Project Loans are provided by the Fresno State College Foundation. These loans provide financial backing to regularly enrolled students engaged in approved agricultural projects in field crops, horticulture, viticulture, ornamental horticulture, livestock, poultry and dairy. Arrangements for project loans may be made by students through their advisers.

The K. Arakelian Foundation Loan Fund was established by the K. Arakelian Foundation and provides financial assistance to senor and graduate students attending Fresno State College. Loans granted from this fund may be repaid after graduation.

The Mary C. Baker Trust Fund was established by Mary C. Baker, a former dean of women. It provides small emergency loans to students.

The Hal Beatty Benefit Fund was originated by the Delta Sigma Phi Fraternity and is sponsored by the fraternity, students, faculty and friends of Fresno State College. The fund was established in 1953 for the purpose of aiding Fresno State College students who, because of accident or illness, become physically disabled and require immediate financial assistance. Grants from this fund may be repaid when the student is able to do so.

The Elizabeth Peterson Carnine Loan Fund was established by the Fresno State College Music Department in 1932 as a memorial to Mrs. Elizabeth Carnine. The fund provides emergency loans to students majoring in music.

The Ivan Chapman Loan Fund is made available by Mr. Ivan Chapman primarily for senior students who need financial aid in order to complete their senior year.

The Chi Beta Alpha Fraternity Alumni Loan Fund was established in 1958 by the Chi Beta Alpha Fraternity Alumni. Preference for these loans is given to senior students majoring in agriculture.

The Mrs. Harry Coffee Loan Fund was established in 1929 by Mrs. Harry Coffee to provide financial aid and encouragement to students majoring in music.

The Nat Cohan Loan Fund was established in 1962 through a bequest from the estate of Nat Cohan. Loans from this fund are available to undergraduate students.

The Edward Cribb Memorial Loan Fund was established in 1947 by the Fresno Junior Chamber of Commerce as a memorial to Edward J. Cribb, a former Fresno State College student. Emergency loans are made from this fund with preference being given to veterans.

The Hanford A. Crockard Memorial Loan Fund was established in 1960 by the Northern California Motor Car Dealers Association, Inc. as a memorial to Hanford A. Crockard, a former president of the Association. Loans granted from this fund may be repaid after graduation.

The Fresno Gem and Mineral Society Loan Fund was established in 1962. Loans from this fund are available to senior students majoring in geology.

The Fresno State College Alumni Association Loan Fund was established in 1949 to provide loans to students on an emergency basis in amounts not to exceed $50.

The Fresno State College Association Loan Fund was established by the Associated Students of the college to provide emergency loans to students.

The Syd Glass Memorial Loan Fund was established in 1958 by the friends and family of Syd Glass. The fund provides loans up to $100 to education majors during their last semester in college.

The Floy Montgomery Lewis Loan Fund was established in 1956 by Floy Lewis, a former faculty member. The fund is used to grant loans to students who are majoring in elementary education.

The *Lions Club of Del Rey Loan Fund* was established by the Del Rey Lions Club to provide loans to students in agriculture.

The *H. J. McFarland Memorial Loan Fund* was established in 1952 by the Fresno Scholarship Association to provide financial assistance to residents of Fresno County. Special preference is given to graduates of Fresno County high schools.

The *Charles Lurie McLane Loan Fund* was established in 1959 through a bequest from the estate of Mrs. Elizabeth Price McLane. Loans are limited to students with above-average scholarship majoring in one of the physical sciences.

The *Anna Radka Loan Fund* was established in 1954 to provide emergency loans to male students attending the college.

The *Risley Loan Fund* was established in 1926 by Mr. Thomas E. Risley. Loans from this fund are made available to senior students and may be repaid after graduation.

The *Robert M. Schuler Memorial Loan Fund* was established in 1953 by the employees of radio station KYNO to provide financial aid to students interested in the study of electronics and majoring in physics.

The *Laura E. Settle Loan Fund* was established in 1956 by the California Retired Teachers' Association as a memorial to Laura E. Settle.

The *William Motier Tucker Memorial Loan Fund* was established by his former students as a memorial to William Motier Tucker. Loans from this fund are available to students majoring in geology.

The Alumni Trust Council Loan Funds

A number of loan funds are administered by the Fresno State College Alumni Trust Council, Inc. These loans, available in varying amounts, are repaid on terms arranged with the student at the time the loan is made. Further information may be obtained from the Fresno State College Alumni Association Office on the campus. Loans granted from these loan funds may be repaid after graduation.

National Defense Student Loan Program

Fresno State College participates in the federal loan program which is provided for in Title II of the National Defense Education Act of 1958. Under this program needy students in any field of study may borrow up to $1,000 a year, for a maximum of $5,000. Students entering college for the first time as well as continuing students are eligible to apply for this type of loan.

No interest is charged until one year after the borrower ceases to be a full-time student. The first payments on these loans are required a year after the end of the one-year grace period, and interest thereafter is to be paid at the rate of 3 percent per year. *A borrower who becomes a full-time teacher in a public elementary or secondary school may have up to 50 percent of his loan cancelled.*

Needy students with superior academic backgrounds, who are interested in teaching in public elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language, should consider the benefits of this program. Inquiries should be directed to the Coordinator of Financial Aids, Fresno State College, Fresno, California 93726.

State and Federal Aid to Veterans

The office of the Dean of Students maintains liaison with the Veterans Administration and the State Department of Veterans Affairs. The Coordinator of Financial Aids at the college assists veterans in conducting their affairs with these agencies.

In order to enroll and obtain benefits under Public Law 550 ("Korean" GI Bill), a veteran must obtain a Certificate for Education and Training (VA Form 7-1993) from the Veterans Administration and present it to the Coordinator of Financial Aids at the time of registration.

Students planning to enroll and obtain benefits under Public Law 634 (War Orphans Education Act) should obtain a Certificate For A Program Of Education (VA Form VB7-5493) from the Veterans Administration and present it to the Coordinator of Financial Aids at the time of registration.

The college is also approved for the training of disabled Korean War veterans (Public Law 894). Veterans who plan to attend the college on this program should notify the Veterans Administration of their intentions to enter Fresno State College well in advance of the registration period.

Veterans planning to attend the college under benefits available from the State of California (Cal-Vet) must obtain the required authorization each semester from the State Department of Veterans Affairs, Box 1559, Sacramento, California.

Information on the above educational programs at the college may be obtained by writing to the Coordinator of Financial Aids.

State Aid to the Handicapped

The State of California, through its Vocational Rehabilitation Service, provides financial assistance to students, both civilian and military, who have physical or emotional disabilities. This assistance equals the necessary school expenses and may include an additional amount to help cover the cost of living. Students who may be entitled to this assistance should apply to the Vocational Rehabilitation Service, 2550 Mariposa, Fresno, California 93721.

EDUCATIONAL SERVICES

Note: Students enrolling in summer session or extension are not required to be officially admitted to the college.

EXTENSION CLASSES

The college offers off-campus extension classes in regularly listed college courses when student demand is sufficiently large to finance the instruction. These courses are arranged each year in the area served by the college. *For information regarding courses, course fees, and instructional costs, write to the Dean of Educational Services and Summer Sessions.*

The college allows enrollment in 6 units of extension courses per semester as a maximum for teachers employed full time. See *Program Restrictions* for statement regarding extension classes. Not more than a total of 24 units by extension and correspondence can be applied toward a bachelor's degree. Not more than 12 units of extension and correspondence courses may be transferred from another college or university.

Not more than 6 units of the 30 units required for the master's degree may be earned in extension courses, student teaching, transfer credit or any combination of these. When 200 series courses are taught by extension and carry the designation E after the number, they are counted as upper division courses (100 series) in master's degree programs. Candidates for the master's degree should check with the Graduate Office or departmental graduate adviser to learn whether specific extension courses may be applied on their graduate programs.

SUMMER SESSIONS

Fresno State College conducts summer sessions on its campus in Fresno, on the Bakersfield College campus, and on the College of the Sequoias campus in Visalia. Special workshop sessions are held in other valley centers. The Fresno and Bakersfield six-week sessions follow the spring semester; the Visalia and Fresno post sessions follow the Fresno and Bakersfield sessions, offering the possibility of completing a maximum of 11 weeks in a single summer. Not more than one semester unit may be earned for each week of attendance, except that upon approval of appropriate college authorities additional semester units may be earned at the rate of one-half unit for each three units for which a student is registered in a three-week period. The offerings at these sessions include a variety of courses leading to the bachelor's and master's degrees. The program includes courses to meet the requirements for elementary, secondary, administration, supervision, and special credentials and in-service professional needs in various fields. Courses of a general cultural nature in various academic departments are also offered. *A bulletin describing the offerings of all sessions is ready for distribution in March. Students who are interested in attending should write to the Dean of Educational Services and Summer Sessions, Fresno State College, Fresno, California 93726.*

BAKERSFIELD CENTER

The Bakersfield Center operated by Fresno State College was established by legislative action in September 1956. The program at the center is an integral part of Fresno State College and is under the general direction of the Dean of Educational Services and Summer Sessions. It includes the recommended college program

of courses leading to a bachelor's degree and elementary credential. The program is restricted to upper division courses applicable to this degree and credential.

Students who plan to attend the Bakersfield Center must apply for admission to the Director of the Bakersfield Center, Fresno State College, 4021 Mt. Vernon Avenue, Bakersfield, California 93302.

Students who plan to complete credential requirements at the Bakersfield Center must be separately admitted to the credential program. This is in addition to the general admission procedures above. For information concerning procedures for admission to a credential program and the revised credential program write to the Director of the Bakersfield Center.

SUDAN EDUCATIONAL PROJECT

Fresno State College, under contract with the United States Agency for International Development, Washington, D.C., established an educational project in Sudan, Africa, in September 1961. The project provided technical assistants and consultants to the Sudanese Government through its Ministry of Education in an effort to improve the quality and quantity of elementary education programs in the Sudan. During the first two years of the program the college sent a team of 13 faculty members to Sudan to work in the areas of teacher education, elementary education, agricultural education, and home economics education in the following established institutes: Bakht-er-Ruda, Shendi, Dilling, and Maridi Teacher Training Institutes; and Omdurman and Wad Medani Women's Teacher Training Colleges. In an extended year's program beyond the original two-year contract, a smaller team worked abroad in the same areas directed toward the same objectives.

For further information consult the Campus Coordinator of the Sudan Project, Fresno State College Extension Center, University and Van Ness Avenues, Fresno, California.

DEGREES AND CREDENTIALS

GENERAL REGULATIONS

Fresno State College is authorized to grant the bachelor of arts, bachelor of science, bachelor of education, bachelor of vocational education, master of arts, master of science, master of business administration, and master of social work degrees. Public school credentials for which the college is authorized to recommend candidates are listed at the end of this section.

APPLICATION FOR DEGREE OR CREDENTIAL

Application for degree or credential must be obtained and filed in the Evaluations Office at the beginning of the semester or summer session term during which the candidate expects to complete requirements. Dates for filing applications are listed in the *College Calendar*. All applications for degrees or credentials filed after the published dates incur a fine of $2; failure to make application will delay the granting of the degree or credential. Diplomas for those completing degree requirements during summer sessions and the fall semester will be awarded at the following June commencement exercises. See *Fees and Expenses*.

POST-BACCALAUREATE CREDIT

Effective fall 1964, upper division units earned at Fresno State College in the semester or summer session in which the bachelor's degree is granted but which are not needed in any way for such a degree will be listed on the student's record as *post-baccalaureate credit* subject to the following limitations: The student, at the beginning of the last semester, is within nine units of his bachelor's degree and is in good academic standing (not on academic probation). Only credit for courses in which grades A, B, C, or P are earned, may be counted.

Use of such credit for graduate degrees at Fresno State College requires special approval (consult Graduate Office). Use of such credit for other purposes is to be determined by the appropriate authority.

BACHELOR'S DEGREES

EVALUATIONS

Transfer students are provided with an advanced standing evaluation as part of the admissions process. Other students, following the completion of 60 semester units, should file a request for an advanced standing evaluation at the Evaluations Office. This evaluation is a summary of general education courses completed and of requirements yet to be fulfilled for a degree. Due to staff limitations only one evaluation can be made for each student.

After evaluation, all transcripts become the property of the Records Office and are not returnable, even on loan. It is suggested that the student obtain duplicate copies of his record from his former schools and keep them for his personal file and for any other purpose for which they may be needed.

ELECTION OF REGULATIONS

A student remaining in continuous attendance in regular sessions and continuing on the same curriculum may, for purposes of meeting graduation requirements, elect to meet the graduation requirements in effect either at the time of his entering the curriculum or at the time of his graduation. The *General Catalog* lists the official graduation requirements for each year.

RESIDENCE REQUIREMENTS

For the bachelor of arts, bachelor of science, and bachelor of vocational education degrees a minimum of 24 semester units must be earned in residence at Fresno State College; at least one-half of these units (12) must be completed among the last 20 semester units counted toward the degree. Summer session credit may be applied on this requirement on a unit for unit basis.

For special residence requirements see *Public School Credentials* and *Master's Degrees.*

For limitation on credit by extension and correspondence, see *Extension Classes.*

SCHOLARSHIP REQUIREMENTS

To qualify for any bachelor's degree a student must have at least a C average (2.0 on a four grade-point system) on his total college record, must have maintained at least a C average at Fresno State College, and must have at least a C average in his approved major.

See also *Education Division—Application for Admission to Credential Programs* and *Master's Degrees—Grade Requirements.*

SPECIAL COURSE REQUIREMENTS

Entering undergraduate students should note the following specific requirements:

(1) *Physical Education Activities* (PE 10, 40, or 50 series). Students are expected to take these activities during their first four semesters. The physical education requirement may be waived only on request for students who have medical excuse from the college physician, or who are 25 years of age or older. Requests for this waiver or any deviation in meeting the requirement must be submitted to the Dean of Students Office. Basic air science (4 semesters) may be substituted for the physical education requirement. See *General Education Requirements.*

(2) *English A* is required of entering freshmen not passing the English entrance examination. Units in English A will count as electives for graduation but will not satisfy any of the general education requirements.

(3) *Speech Correction 1X* is required as a prerequisite to all other speech courses for those students who do not pass the speech entrance test. Units in Speech Correction 1X will count as electives for graduation but will not satisfy any of the general education requirements.

(4) *Elementary Algebra and Plane Geometry* are required for graduation, if they have not been completed in high school. See *Mathematics Department—Duplication of Courses.*

FOREIGN LANGUAGE REQUIREMENT

Foreign language is not a general college requirement for admission to or graduation from Fresno State College.

However, some divisions and departments require the study of a foreign language as part of the preparation for specified undergraduate and graduate majors. In general, upper division and graduate courses in these fields require the use of foreign language. See division and department statements of majors for details and suggestions for appropriate languages.

Students following majors which require the study of a foreign language ordinarily meet the requirement in one of the following ways:

1. Students who have no foreign language credit from high school complete two years of satisfactory collegiate study in one foreign language.
2. Students who have high school credit or other experience in a foreign language and who wish to continue in the same language are required to take a foreign language placement test before enrolling in a foreign language class. Normally students beginning a new language will enroll in the 1A class. College credit may be earned in the class in which the student is placed, except in instances

where a student is placed in a class in which he will be repeating more than one year of high school work.

Successful completion of a 2B foreign language course will be accepted as fulfillment of the foreign language requirement. Students taking the foreign language placement test and placing beyond the 2B level will be certified as having met the foreign language requirement. Consult the *Schedule of Courses* for dates of placement tests.

3. Students who do not have the prescribed high school or college credit may elect to meet the foreign language requirement by passing a competence examination. Usually only lower division courses in foreign language may be passed by examination. Credit by examination will be granted in foreign language only prior to the completion of the first upper division course in the same foreign language and may be obtained only in languages taught at the college. See the chairman of the Foreign Language Department.
4. Students seeking a second bachelor's degree major or a master's degree will be held for any foreign language requirement in the field.
5. Unless the major specifies the language to be used, a foreign student may offer English to meet the requirement, provided his native language is not English and provided he has come to this country primarily to pursue academic work and expects to return to his home after completing his course of study.

GENERAL EDUCATION

Through its general education program, Fresno State College attempts to ensure that, in addition to his field of specialization, each student shall have an opportunity to prepare for the broad responsibilities society expects of a college graduate. Toward this end, the general education program places particular emphasis on those kinds of knowledge and understanding which an institution of higher education is especially equipped to provide.

The *California Administrative Code Title 5* provides for a minimum of 45 units of General Education, with 31 specified units and 14 units distributed by the college. Fresno State College interprets this requirement as outlined in this section for degree programs. (See *Education Division* for information on general education requirements for credentials.)

Selection of Courses

Students are urged to consider their selections carefully to complement the major in such a way as to produce a well-rounded degree program. In the interest of a balanced general education, not more than two semester courses should be selected from any one subject field (e.g., botany, chemistry, history, literature, mathematics, sociology, zoology).

In the event of a difference between the number of units used to meet a requirement and the number of units specified for that requirement, this difference may be absorbed in Requirement 7 if there is an appropriate category.

General education requirements are in addition to degree major requirements; no units counted as part of a student's degree major may also be counted as part of his 45 units of general education. Appropriate general education courses may be used toward completion of a minor or toward "Additional Requirements" beyond the degree major.

GENERAL EDUCATION REQUIREMENTS

The statements in *italics* define the intent of the program. Courses at Fresno State College acceptable to meet this intent are listed below. A minimum of 45 semester units is required.

Units

1. SOCIAL SCIENCE 9

To include at least one course from the area of man and culture and provide for meeting the requirement in American history and federal, state, and local government.

SELECT ONE FROM EACH GROUP:
Man and Culture: Hist 1, 2, Anthro 2, Geog 3, 4, Soc 1A.
American History: Hist 10, 8A-B.
American Government: Pol Sc 11, 1A-B, 101.

2. NATURAL SCIENCE 9

To include at least one basic concept course in life science and one in physical science.

SELECT AT LEAST ONE FROM EACH GROUP:
Physical Science: Phy Sc 10, 12, Physics 2A, 4A, Chem 1A, 2A, Geol. 1.
Biological Science: Biol 1A, 1B, 2A, Bot 1, Zool 1.

SELECT ADDITIONAL SCIENCE (if needed to complete units):
Physics 2B, 4B, 4C, 55, Chem 1B, 2B, 8, Geog 5, Biol 2B, Physio 1.

3. LITERATURE, PHILOSOPHY, AND THE ARTS 6

To include an introduction to literature, philosophy, or logic (three units) and one or more courses providing experience in or acquaintance with creative expression in the arts.

SELECT ONE (THREE UNITS) FROM LITERATURE, PHILOSOPHY, OR LOGIC:
Phil 3 (if Engl 4 is to be used for Requirement 5).
Engl 20 (if Engl 1 or 3 is used for Requirement 5).
Phil 1, 5, 10A or 10B (if Engl 1 is used for Requirement 5).

SELECT (THREE UNITS) FROM THE FOLLOWING ARTS:
Art 3, 4, 11, 119, 144.
Mus 76, 1 or 101, 11A, 11B, 121A, 121B, 156, 166.
Drama 62, 184, 185A, 185B, R-TV 128, Spch 22, 122.
IA 133, 146, 162, 177, 179.
PE 140-16, 140-17, 140-18.

4. HEALTH AND PHYSICAL EDUCATION 3

To include physical education activity and to meet the mental and physical health requirements. The college requires four semesters of physical education; two units apply here. See *Special Course Requirements.*

SELECT FOUR SEMESTERS (TWO UNITS APPLY HERE) PE 10, 40, 50 series.

SELECT ONE: H Ed 90, 91.

5. ORAL AND WRITTEN ENGLISH 6

To be equally divided between oral and written English.

REQUIRED: Spch 21.

SELECT ONE: Engl 1, 3, 4.

(For a year sequence in composition and literature or philosophy combine parts of Requirements 3 and 5 as follows: Phil 3 and Engl 4; Engl 3 and Engl 20; Engl 1 and Engl 20; or Engl 1 and Phil 1, 5, 10A, or 10B).

6. PSYCHOLOGY 3

To include an introduction to psychology.

SELECT ONE: Psych 7, 10.

7. ADDITIONAL UNITS OUTSIDE MAJOR FIELD TO COMPLETE TOTAL OF 45 UNITS 9

To be distributed among categories listed below; to include at least two categories; and to consist of courses which have broad scope, relate fields of study, or provide widely applicable theory.

SELECT FROM AT LEAST TWO CATEGORIES:
(Courses listed in Requirements 1-6 above may be used in the appropriate section of Requirement 7, provided the same units are not applied in both places.)

FOREIGN LANGUAGE: Any courses in foreign language (maximum 6 units).

HUMANITIES: Engl 61, 84, 93, 134, 176, 180, 181, 182, 183, Phil 102, 130, courses listed in English and Philosophy in Requirement 3.

MATHEMATICS: Math B, C, 3, 4, 40, 103, 130, 140.

NATURAL SCIENCES: Biol 173, Geol 2, Phys Sc 21, courses listed in Requirement 2.

SOCIAL SCIENCES: Econ 1A, 1B, 110, Geog 116, 177, Hist 4A-B, 176, 181, Soc 1B, 111, courses listed in Requirement 1.

ARTS: Courses listed in Requirement 3.

PSYCHOLOGY, JOURNALISM, BUSINESS, HOME ECONOMICS, SPEECH ARTS: Psych 145, Jour 104, 150, Bus Ad 8, 10, H Ec 42, 131, Spch 121, 124.

BACHELOR OF ARTS DEGREE

For the bachelor of arts degree a minimum of 124 semester units must be completed and must include at least 40 upper division units. Upper division courses taken before the student has earned 45 units may not be applied on this 40-unit requirement.

The general degree requirements, general education requirements, and one major must be satisfactorily completed, see *Degree Majors and Minors;* and any minor requirements listed for a given major must be met. Units used to meet the general education requirements may not apply on the degree major. If a second concurrent major is desired, courses acceptable for satisfaction of general education requirements for the first major may be used to satisfy second major requirements. Electives may be used to fulfill or to apply on requirements for a credential or for one or more minors, or they may be free electives selected with help of an adviser. While a minor is not required for most degree majors, students are encouraged to study the minor offerings of the various departments and consult their advisers to determine whether one or more minors would be an appropriate complement to their college programs.

BACHELOR OF SCIENCE DEGREE

For the bachelor of science degree, a minimum of 124 to 136 semester units depending on the major field must be completed. The general degree requirements, general education requirements, and one major must be satisfactorily completed, see *Degree Majors and Minors.* Courses used to meet the general education requirement may not apply on the major. If a second major is taken concurrently or consecutively, courses acceptable for satisfaction of general education requirements for the first major may be used to satisfy second major requirements.

BACHELOR OF EDUCATION DEGREE

Effective July 1, 1964, students will no longer be accepted to work toward a bachelor of education degree at Fresno State College. See *Education Division.*

BACHELOR OF VOCATIONAL EDUCATION DEGREE

The bachelor of vocational education degree is a special degree limited to California vocational teachers recommended by the State Board of Examiners for Vocational Teachers. For requirements, see *Industrial Arts Department.*

DEGREE MAJORS AND MINORS

Fresno State College offers majors as indicated below for the bachelor of arts (BA), bachelor of science (BS), bachelor of education (BEd), bachelor of vocational education (BVEd), master of arts (MA), master of science (MS), master of business administration (MBA), and master of social work (MSW) degrees. A major for a degree consists of an approved program of courses designed to give depth in a principal subject or discipline. Requirements for approved majors are listed in the appropriate department or division sections of the *General Catalog*. When selections are made within the major, these choices must have departmental approval.

Minors are also offered in the areas listed below with the exception of those marked with an asterisk (*). For requirements see departments concerned.

Accounting * ..... BS
Agribusiness * ..... BS
- agricultural mechanics
- animal science
- business
- plant science

Agricultural engineering * ..... BS
Agriculture ..... BS
- agricultural inspection and services
- agricultural mechanics
- agronomy
- animal husbandry
- dairy science
  - dairy husbandry
  - dairy industry
- general agriculture
- horticulture
- ornamental horticulture
- poultry husbandry
- viticulture and enology
  - enology
  - viticulture

Air science ..... minor only
Anthropology ..... BA
Art ..... BA, MA
Biology ..... BA, BS, MA
Botany * ..... BA
Business ..... MA, MS
Business administration * ..... BS, MBA
Chemistry ..... BA, BS, MS
Criminology * ..... BS, MS
- corrections
- law enforcement

Dramatic art ..... BA
Economics ..... BA, MA
Education * ..... BA, BEd, MA
Engineering * ..... BS
- civil
- electrical-electronics
- industrial
- mechanical

English ..... BA, MA
Foreign language * ..... MA
- French
- German
- Spanish

French (see Foreign Language MA) ..... BA
Geography ..... BA, MA
Geology ..... BA, BS
German (see Foreign Language MA) ..... BA
Health education (see Ed for MA) ..... BA
History ..... BA, MA
Home economics ..... BA
Industrial arts ..... BA, BVEd, MA
Industrial technology * ..... BS
- automotive
- drafting
- electrical
- graphic arts
- metal
- wood

Journalism ..... BA
Latin ..... minor only
Latin-American studies * ..... BA
Life sciences * ..... BA
Marketing * ..... BS
Mathematics ..... BA, BS, MA, MS
Microbiology * ..... BA
Music ..... BA, MA
Nursing * ..... BS
Office administration * ..... BS
Philosophy ..... BA
Philosophy-psychology * ..... BA
Physical education-men ..... BA, MA
Physical education-women ..... BA, MA
Physics ..... BA, BS, MA, MS
Political science ..... BA
Psychology ..... BA, MA
Public administration ..... BA
Radio-television broadcasting ..... BA
Recreation ..... BS
Romance languages * ..... BA
Russian ..... minor only
Social science * ..... BA, MA
Social welfare * ..... BA
Social work * ..... MSW
Sociology ..... BA
Spanish (see Foreign Language MA) ..... BA
Special * (see below) ..... BA
Speech ..... BA, MA
Zoology * ..... BA

Special Major. A student may propose a program of correlated studies in two or more fields for a special major. This program must be based on a minimum of 24 units of which 12 are upper division and have the approval of chairmen of the departments concerned and the Dean of the College.

MASTER'S DEGREES

Fresno State College is authorized to grant the following master's degrees: master of arts degree in art, biology, business, economics, education, English, foreign language (French, German, or Spanish), geography, history, industrial arts, mathematics, music, physical education, physics, psychology, social science, and speech; master of science degree in business, chemistry, criminology, mathematics, and physics; professional degrees, master of business administration and master of social work. See *Degree Majors and Minors.*

To be eligible to receive the master's degree a student must have achieved a command of his field of specialization and must have demonstrated competence in independent investigation, analysis, and synthesis beyond the scope of individual courses. *The requirements listed in the following sections are minimums.* For details of specific curricula see the department statements and the *Graduate Bulletin.*

GENERAL REGULATIONS

Applicants for all master's degrees are admitted to graduate standing, programmed, and advanced to candidacy under the same college-wide policies. Most departments, however, impose additional requirements for admission to specific programs, advancement, and completion.

ADMISSION TO GRADUATE STANDING

Admission standards are stated in the *California Administrative Code, Title 5, Education,* which provides uniform admission regulations for all California state colleges as follows:

41000. Admission with Graduate Standing: Unclassified. (a) For admission with graduate standing as an unclassified graduate student, a student shall have completed a four-year college course and hold an acceptable baccalaureate degree from an accredited institution; or shall have completed equivalent academic preparation as determined by the appropriate college authorities.

(b) Admission to a state college with graduate standing does not constitute admission to graduate degree curricula.

41001. Admission to Graduate Degree Curricula: Classified. A student who has been admitted to a state college under Section 41000 may, upon application, be admitted to an authorized graduate degree curriculum of the college as a classified graduate student if he satisfactorily meets the professional, personal, scholastic, and other standards for graduate study, including qualifying examinations, as the appropriate college authorities may prescribe. Only those applicants who show promise of success and fitness will be admitted to graduate degree curricula, and only those who continue to demonstrate a satisfactory level of scholastic competence and fitness, as determined by the appropriate college authorities, shall be eligible to continue in such curricula. Students whose performance in a graduate degree curriculum is judged to be unsatisfactory by the authorities of the college may be required to withdraw from all graduate degree curricula offered by the college.

GRADUATE ADMISSION PROCEDURES

Graduate admission is a two-step process. *Unclassified graduate standing,* the first step, is required of all holders of bachelor's degrees, regardless of objective. *Classified graduate standing,* the second step, is required only of students working toward master's degrees.

UNCLASSIFIED GRADUATE STANDING

A student who holds a bachelor's degree may be admitted to unclassified graduate standing according to the appropriate procedure listed below. This status permits him to enroll in undergraduate or graduate courses for which he has the prerequisites. (See *Course Numbering System—Eligibility and Definitions* and individual course descriptions.)

1. *A graduate of Fresno State College who has taken no subsequent collegiate work elsewhere* may be admitted to *unclassified graduate standing* upon the filing of the application for graduate standing.
2. *A graduate of another accredited institution, or a Fresno State College graduate who has subsequently attended another institution,* may be admitted to unclassified graduate standing upon the filing of the application and two copies of official transcripts showing the highest degree earned and good standing in all work taken subsequent to that degree.

Provisional Graduate Standing. A student who does not have a degree or credential objective may be admitted with *provisional graduate standing* upon the filing of the application declaring all schools attended since high school and one copy of an official transcript showing the granting of the bachelor's degree. (Transcripts for bachelor's degrees earned at Fresno State College are already on file and need not be resubmitted.) Subsequent changes to degree or credential applicant status will necessitate the filing of any additional transcripts required for *classified or unclassified graduate standing.*

Unvalidated Graduate Standing. A graduate of a nonaccredited college may be granted admission with *unvalidated graduate standing,* upon the filing of the application and two copies of official transcripts of all college work. Such a student may be eligible for unclassified graduate standing when he has cleared all undergraduate deficiencies and has maintained, in residence at Fresno State College, a grade-point average of 3.0 (on a four grade-point system) on 12 units of approved upper division work or an average of 2.5 on 24 units of approved upper division work. (Potential master's degree students, see also *Master's Degrees—Grade Requirements.*) When a student with this type of graduate standing has fulfilled the requirements for *classified or unclassified graduate standing,* it is his responsibility to request a new statement of standing from the Admissions Office.

CLASSIFIED GRADUATE STANDING

A graduate student who expects to have his course work apply toward a master's degree should clearly indicate his master's degree objective on the application for graduate standing which he sends to the Admissions Office. As soon as his admission to the college has been processed, the Graduate Office will inform him of the procedures for obtaining admission to the degree program with *classified status.* Since these procedures regularly involve an interview, the process is not ordinarily completed until after registration for the first semester. Normally instructions for achieving classified status are mailed by the Graduate Office to admitted students who have indicated degree objectives. Any degree aspirant who does not receive instruction in the mail is invited to come or write to the Graduate Office for this material prior to consulting an adviser.

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. Requirements for advancement to candidacy include the following:

1. Classified graduate standing.
2. Completion of any specified undergraduate prerequisites to the master's degree major.
3. Satisfactory completion of a scholastic aptitude test for graduates and such departmental and scholastic achievement tests as may be required.
4. A grade point average of 3.0 (both over-all and at Fresno State College) on all upper division and graduate course work completed after the bachelor's degree or from the date of embarking on the first course of the proposed master's degree program.
5. Approval by the appropriate departmental graduate committee. Ordinarily upon receipt of examination scores the Graduate Office sends to the department committee a transcript and a report of grades and examination scores and requests departmental recommendation. 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. A student who does not qualify at this time has the responsibility for initiating the procedure in the Graduate Office when he has removed deficiencies.
6. Formulation of a departmentally approved contract program of graduate study for the master's degree.
7. Completion at Fresno State College of at least 9 units of the proposed program with a 3.0 average on all completed work appearing on the program.
8. As soon as possible after the completion of steps 1 through 7, submission to the Graduate Office of a properly signed petition for advancement to candidacy, including the proposed contract program.

PROGRAM REQUIREMENTS

The program requirements for the master of arts and master of sicence degrees assume substantial undergradate preparation in the field. See division and department statements in this catalog or in the *Graduate Bulletin* for particulars. A student lacking this preparation will find it necessary to exceed the minimum requirements indicated below. (Consult departments for MBA and MSW minima.)

The contract program for the master's degree is a coherent pattern of (1) courses specified for an approved field of concentration 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 within seven 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 divisions or departments and approved by the Committee on Graduate Study are acceptable on the unit requirement. In individual cases and subject to departmental approval, 300 series courses may be applied under special circumstances toward unit requirements of master's degree programs for which the course work is appropriate. 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 total contract program must include the following:

1. At least 24 units of the program must be Fresno State College residence credit, 6 units of which must have been taken on the Fresno campus prior to enrolling for the thesis or project or for a seminar alternative to the thesis.
2. Of the 30 units for the degree, not more than 6 units may consist of any combination of student teaching, extension courses, or transfer credit. 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 Committee on Graduate Study. Credit by examination may be used to fulfill prerequisites, but may not apply toward the 30 units.
3. With approval of departmental graduate adviser, post-baccalaureate credit allowed for work taken in the final semester or summer session of the senior year may be applied toward a master's degree, if it meets master's degree criteria in all respects. See *Post-Baccalaureate Credit.*
4. At least 12 units must be in courses designed primarily for master's degrees (numbered in the 200 series). Some majors require more than 12 units of 200 series course work.
5. At least 10 units must be completed after advancement to candidacy. Work taken during the semester of advancement may apply on this requirement.
6. Appropriate course work from a field other than the major may be required at the discretion of the major department.
7. Appropriate provision must be made for a thesis, a project, or, when permitted, a seminar alternative.

It is the student's responsibility to complete the specific courses listed on his contract program. Once a contract program has been approved by the Committee on Graduate Study, it may be changed only on the written request of the student and his department or division adviser and with the approval of the Graduate Office. Forms for requesting such program adjustment are available in the Graduate Office.

THESIS REQUIREMENT

Most master's degree curricula at Fresno State College require the preparation of a thesis or a project. For the master of arts degree in education and for the master of science degrees in business, mathematics, and physics, specially designed or selected seminars may be substituted for the thesis requirement (see Bus 291, AEd 295, 296, 297, 298).

The Committee on Graduate Study has prepared a statement describing the general college policy on research in the master's degree program. Theses, projects, and other types of research are defined. In general, regulations for the project are identical to those of the thesis.

1. To be eligible to enroll for thesis or project (299), a student must have
   (a) been advanced to candidacy for the master's degree.
   (b) maintained a B (3.0) average on his contract program.
   (c) completed at least six units of his contract 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 chairman and at least two other members.
   (f) secured approval of his thesis plan from the division or department graduate committee before his committee submits thesis committee assignment (Form 13) to the Graduate Office.

2. A student may enroll in 299, thesis or project, at any time after he has met the requirements listed in (a) through (f) above. However, if a student fails to enroll within one semester (excluding summer sessions) after his official acceptance by a thesis committee, the committee is dissolved and its members are relieved of further obligation to the student.
3. A student whose thesis is planned to extend over more than the semester in which he first enrolls in 299 may receive an In Progress (IP) grade, which may remain in effect for one full year after being recorded. If at the end of this time the thesis has not been completed, the thesis committee and the library are relieved of any further thesis obligation to the student. The student must re-enroll and apply for a new committee in each subsequent semester or summer session during which he uses the library or draws on faculty time in connection with his thesis. The new committee will not necessarily be composed of the same personnel and is not necessarily bound by the decisions of the former committee.
4. The student and his thesis chairman should set a deadline for the completion of the semifinal draft, no later than four weeks before the last day of scheduled final examinations. This date should be early enough so that the chairman and the other members of the committee can clear the draft before the student must meet the deadline for clearance by the technical adviser.
5. Before a thesis is officially accepted by the Committee on Graduate Study, it must meet the approval of the committee's technical adviser, who passes on matters of format, documentation, and quality of writing. The semifinal draft, initialed by the thesis chairman as acceptable with technical corrections, should be submitted to the technical adviser in the College Library at least three 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 not be accepted until the following semester or summer session. Students are urged to follow meticulously the specifications for the master's thesis, copies of which are available from the Graduate Office.
6. Four copies (three to be retained by the college) signed by the thesis chairman and ready for binding, together with the divisional clearance (Form 49-G17) must be submitted to the Graduate Office no later than one week before the last day of scheduled final examinations. A fee for binding is due and payable at the Fresno State College Association Office on the date of final submission. A student who wishes to retain more than one bound copy may arrange for the extra binding by paying an additional fee. (See *Schedule of Fees.*)

APPLICATION FOR DEGREE

An application for the master's degree must be filed in the Evaluations Office in the first two weeks of a semester or first week of a summer session. (For dates see *College Calendar* or *Schedule of Courses;* see also *Schedule of Fees.*)

Failure to complete requirements for the degree during the semester of the application necessitates the filing of a new application for the semester of actual completion.

FOREIGN LANGUAGE REQUIREMENT

Fresno State College does not have a general foreign language requirement for the master's degree. Some specific master's degree majors do, however, require competence in an appropriate foreign language. (See *Degrees and Credentials—Foreign Language Requirement* and department requirements.) Students who con-

template graduate study beyond the master's degree are urged also to investigate foreign language requirements in the institution in which they anticipate advanced graduate study.

MAXIMUM STUDY LOAD

Students are warned that graduate courses require substantially more concentrated study than do undergraduate courses. During the fall or spring semester 16 units is the maximum load for master's degree students in full-time attendance when one or more courses in the 200 series are included. Students employed full time may take a maximum of 6 units. For maximum units for summer session see the *Summer Session Bulletin.*

GRADE REQUIREMENTS

All graduate students will be held to the scholarship standards listed under *Regulations and Procedures.*

No course with a grade below C may apply on a master's degree contract program.

To be eligible for advancement to candidacy, a student must have earned a B average on all upper division and graduate course work completed after the bachelor's degree or 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 or in a seminar alternative to the thesis, a student must have been advanced to candidacy and must have maintained a B average on his contract program.

To be eligible for the granting of the degree, a student must have maintained a B average on his complete contract program. Any grade earned in a course on the contract 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 a 3.9 grade-point average on the contract program for the master's degree or on all upper division and graduate work subsequent to the bachelor's degree. He must also be nominated by his department.

EXAMINATIONS

In addition to the qualifying examinations required for advancement to candidacy for the master's degree, all departments reserve the right to require written or oral comprehensive examinations when circumstances demand. A few departments require final comprehensive examinations of all their students. Candidates are urged to consult the chairman of the division graduate committee or the Graduate Office about examination requirements.

EXTENSION OF TIME

A period of seven years is allowed for the completion of all requirements for the degree. A student whose program has been interrupted by military service should consult his adviser about provisions for military extensions. Otherwise, time may be extended only by the substitution of recent courses for outdated ones or by the passing of comprehensive examinations in the relevant courses or subject field.

PUBLIC SCHOOL CREDENTIALS

Fresno State College is authorized by the State Board of Education to recommend candidates for public school service credentials in elementary and secondary teaching, administration and supervision, pupil personnel services and special education. Courses leading to the specialization in junior college teaching are also offered.

All students must meet certain minimum requirements prior to admission to a credential program. The requirements are listed in the *Educational Division.* Holders of bachelor's degrees must complete a minimum of 15 semester units of postgraduate work in residence at Fresno State College to qualify for a college recommended teaching credential. Candidates for the administration, supervision, and pupil personnel services credential must complete at least one half of the required postgraduate work in residence.

The revised credential structure under the *Licensing of Certificated Personnel Law of 1961,* effective January 1, 1964, reduces the number of public school credentials to five basic types *(California Education Code, Section 13187).* For requirements for the following credentials see the *Education Division*:

The Standard Teaching Credential With a Specialization in Elementary Teaching, Secondary Teaching, or Junior College Teaching.
The Standard Designated Subjects Teaching Credential.
The Standard Designated Services Credential.
The Standard Supervision Credential.
The Standard Administration Credential.

For information regarding prior credential programs see the *Education Division* and earlier *General Catalogs.*

PREPROFESSIONAL PREPARATION

Preprofessional programs are available for students who plan to transfer to another institution for the completion of professional curricula in such fields as dentistry, forestry, law, librarianship, medicine, optometry, occupational therapy, pharmacy, physical therapy, theology, and veterinary medicine. Certain of these programs are described below. Students should consult an adviser and the catalog of the school of their choice. Students planning to complete a preprofessional program and degree at Fresno State College must enroll in a major offered at this college.

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) to make a total of 60 units. Each science course must include laboratory.

The trend among dental schools is to require more than two years of predental training including a broad liberal arts background. Additional science courses recommended or required include a year course of organic chemistry instead of one semester, quantitative chemical analysis, elementary physical chemistry, other zoology courses, and in some cases a foreign language. Several schools require a bachelor's degree for entrance. The applicant is usually required to take the American Dental Association aptitude test and present evidence of physical fitness and good moral character. 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

Many law schools require a bachelor's degree for admission. It is, therefore, advisable for students preparing for law to arrange a four-year program leading to a bachelor's degree. Law schools recommend a prelegal program which gives a broad cultural background; any baccalaureate major may be chosen from the college offerings (see list under *Degree Majors and Minors*). The prelegal student should choose the major most interesting to him. Law schools suggest courses, but not necessarily a major, in the following: written and oral English, American and English constitutional history, world history, accounting, elementary logic, mathematics, economics, political science, philosophy, science, and foreign language. For further information consult an 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 two modern foreign languages is a requirement for admission to most graduate schools of librarianship; this requirement is normally satisfied by the successful completion of one college year in each of the languages. Students considering librarianship as a career should consult the prelibrary program adviser in the Library.

PREMEDICAL

Medical colleges vary widely in their specific requirements for admission. All medical schools require completion of three years of college (a minimum of 90

semester units) with a C average or better. A program which includes 38 semester units of natural science distributed in biology (12 units), chemistry (18), and physics (8), one year of English, including composition, and a reading knowledge of a modern foreign language will qualify a student for most medical schools. The applicant is usually required to take the medical aptitude test and to present evidence of physical fitness and moral character.

It is occasionally possible for a good student to complete all general requirements for a bachelor's degree in three years of premedical study and be awarded a bachelor's degree by Fresno State College upon the completion of the first year of medicine in an accredited medical school. Due to competition for admission to medical schools the majority of students find it necessary to complete the four-year program for the bachelor's degree and to achieve a grade average of better than C.

Each student embarking on a premedical course at Fresno State College will be assigned to a member of the premedical advisory committee who will assist him in planning his course and will maintain close contact with him during the first year. During this period, screening tests are available to aid in ascertaining fields in which the student possesses the greatest interest, achievement, and aptitude. By the beginning of the sophomore year the student will be expected to select his major, and will be assigned to an adviser qualified to guide him in his field of concentration.

Although the premedical requirements include a minimum of 38 units of natural science, it does not follow that the premedical student must load his program with many additional units in the sciences. In fact, a student who has particular aptitude and interest in the social sciences or humanities may well elect his major in one of these fields, and still be able to meet the premedical requirements quite satisfactorily. The medical schools continue to report that they do not expect entering students to be finished technicians, but that they are more concerned with a good record in the specific science requirements, evidence of a well-balanced liberal education, and the ability to adapt to the rigid disciplines of medicine.

The college, through its premedical advisory committee, will make every effort to guide the student through the premedical course successfully, and will endeavor to assist those who have demonstrated suitability for the study of medicine to gain admission to the medical school of their choice. The committee, when requested, will submit its appraisal of each student to the medical schools to which the student applies for admission.

PRETHEOLOGICAL

Students planning to attend a theological seminary or school may satisfy the undergraduate requirements at Fresno State College. Seminaries or schools which are members of The American Association of Theological Schools for graduate study suggests that a pretheological student complete the following courses: English (literature, composition, speech), 6 units; philosophy, 3 units; natural sciences, 2 units; social sciences, 6 units; foreign language, 4 units in Latin, Greek, Hebrew, German, or French; religion, 3 units. The religion requirement may be satisfied at Fresno State College by courses such as Engl 182, Phil 140, or Psych 141. Additional courses are advised for students interested in religious education. The pretheological student is free to choose whatever major he desires. Pretheology faculty advisers will assist in course programming. For further information consult theological school catalogs.

PREVETERINARY

Students planning to attend a school of veterinary medicine may satisfy a part of their requirements at Fresno State College. The Agriculture Division is equipped to provide valuable experience with large animals through the student project program. Students desiring further information regarding the preveterinary curriculum should consult the Dean of the Farm School.

COURSES OF INSTRUCTION

DIVISIONS AND DEPARTMENTS

For administrative purposes the 35 subject matter departments of the college are organized under 12 instructional divisions.

The following section is arranged alphabetically by divisions. Departments are listed within divisions together with requirements in major and minor programs, followed by course descriptions. Faculty members are listed as of the previous academic year.

	Abbrev.
Honors Courses	
Departmental	HD
General College	HC
International Study	Int St
Agriculture Division	
Agriculture	Ag
Agricultural Mechanics Department	AgM
Animal Science Department	
Animal Husbandry	AH
Dairy Science	DS
Poultry Husbandry	PH
Plant Science Department	
Agronomy (Crop Production)	CP
Horticulture	H
Ornamental Horticulture	OH
Viticulture and Enology	V
Air Science Division	Air Sc
Applied Arts Division	
Home Economics Department	H Ec
Industrial Arts Department	IA
Business Division	
Accounting	Acct
Business	Bus
Business Administration	Bus Ad
Business Education	Bus Ed
Marketing	Mkt
Office Administration	Off Ad
Education Division	Ed
Elementary Education Dept.	E Ed
Secondary Education Dept.	S Ed
Advanced Professional Studies Dept.	A Ed
Health Education Dept.	H Ed
Engineering Division	Engr
Fine Arts Division	
Art Department	Art
Music Department	Mus
Letters and Science Division	
Anthropology-Sociology Department	
Anthropology	Anthro
Sociology	Soc
Criminology Department	Crim
Economics Department	Econ
English Department	Engl
Linguistics	Ling
Foreign Language Department	F Lang
French	Fr
German	Germ
Italian	Ital
Latin	Lat
Portuguese	Port
Russian	Russ
Spanish	Span
History Department	Hist
Journalism Department	Jour
Philosophy Department	Phil
Political Science Department	Pol Sc
Social Work Department	
Social Welfare	S Welf
Social Work	SW
Life Science Division	
Biology Department	
Bacteriology	Bact
Biology	Biol
Botany	Bot
Entomology	Ent
Physiology	Physio
Zoology	Zool
Nursing Department	Nurs
Psychology Department	Psych
Physical Education-Recreation Division	
Physical Education—	
Men's Department	PE
Recreation	Rec
Women's Department	PE
Physical Science Division	
Chemistry Department	Chem
Geography Department	Geog
Geology Department	Geol
Mathematics Department	Math
Physical Science	Phy Sc
Physics Department	Physics
Speech Arts Division	
Dramatic Art	Drama
Radio-Television	R-TV
Speech	Spch
Speech Correction	Sp Corr

COURSE NUMBERING SYSTEM

DEFINITIONS AND ELIGIBILITY

Lower Division Courses

Numbers 1-99 designate *lower division (ld) courses* designed for first- and second-year students, but open to others.

Upper Division Courses

Numbers 100-199 designate *upper division (ud) courses* designated for third-, fourth-, and fifth-year students. Such courses will count as graduate work when taken by students who have graduate status (also see *Post-Baccalaureate Credit*). Freshmen and first-semester sophomores are not normally eligible for upper division courses; but second-semester sophomores who have completed a minimum of 45 units are permitted to enroll in the upper division courses for which they have adequate preparation. Course number 190 designates independent study. See *Regulations and Procedures* and specific course prerequisites.

Graduate Courses

Numbers 100G-199G designate courses which combine and intensify material normally offered in undergraduate courses. Designed for use in the first year of two-year master's degree programs, these courses are open only to graduate students.

Numbers 200-299 designate *graduate courses*, open to bachelor's degree holders with adequate preparation and ability. Courses in the 200 series are generally conducted as seminars, requiring original research; some are lectures based upon instructors' research; all involve originality, initiative, and independence of judgment. A second-semester senior with superior preparation and ability may be admitted by the instructor. Course number 290 designates *independent study* at the graduate level; 299 a master's degree thesis or project. See *Regulations and Procedures; Degrees and Credentials;* and specific course prerequisites.

When 200 series courses are taught by extension and carry the designation E after the number, they are counted as upper division courses (100 series) in master's degree programs. For limitation of credit in these courses, see *Extension Classes.*

Numbers 300-399 designate courses whose purpose is to meet professional needs which cannot be served by established undergraduate or graduate offerings. These courses assume completion of the bachelor's degree and professional competence and focus on problems the enrolled students are encountering in their professional service. Although 300 series courses are designed primarily for purposes other than use on degrees and credentials, in individual cases and subject to departmental approval, 300 series courses may be applied toward degree or credential programs for which the course work is appropriate.

OTHER DESIGNATIONS

For *symbols* appearing after course numbers, A-B indicates a two-semester sequence normally to be taken in order; A and B courses which may be taken independently are normally listed as separate items. The following symbols usually indicate: L, a laboratory for another course; F, a field course; E, an extension course; S, a course listed only in the *Summer Session Bulletin;* G, an intensified 100 series course limited to graduate students; HD, a departmental honors course; HC, a general college honors colloquium.

Figures in parentheses following course titles indicate the number of semester units a course carries, and the maximum total credit allowed is indicated by *max total* following the number of units. In general, each unit represents one hour per

week in class and two hours in preparation. Courses involving laboratory, activity, or other application, normally require additional hours of class attendance. Lecture, laboratory hours, etc., following course descriptions indicate deviation from the usual one class hour per week for each unit of credit. Under special circumstances, courses may be offered with reduced unit value with approval of the Dean of the College.

Course *prerequisites* are listed at the beginning of the course description and under *Definitions and Eligibility* above. Unless otherwise stated, the A part is prerequisite to the B part of year courses. Student should check prerequisites before enrolling.

Course offerings for each semester are listed in the *Schedule of Courses*.

HONORS COURSES

The subject matter and course titles of departmental honors courses and general college honors colloquia vary from semester to semester. For the offering in any particular semester see the *Schedule of Courses*. Honors courses are designated by HD or HC preceding the course number. HD indicates a departmental honors course; HC, a general college honors colloquium. Enrollment in honors courses is by invitation. (See *Regulations and Procedures—Honors Program.*)

DEPARTMENTAL HONORS COURSES OFFERED 1963-1964

Hist HD 1. Western Civilization to 1650 (3)
Honors section of Hist 1.

Pol Sc HD 11. American Government and Institutions (3)
Honors section of Pol Sc 11.

GENERAL COLLEGE HONORS COLLOQUIA OFFERED 1963-1964

(Math) HC 70. Mathematical Models (3)
Exploration of mathematical models and their applications in such areas as mathematics, logic, psychology, economics, biology.

(English) HC 170. The Hero in Modern Literature (3)
An examination of 19th and 20th century literature dealing with the genesis and evolution of the *New Hero* or *Anti-Hero*.

(Phil) HC 170. The Greek Mind (3)
An examination of the Greek achievement in art, literature, history, science, and philosophy through the reading and discussion of major works in translation.

INTERNATIONAL STUDY COURSES

Int St 92. Projects in Study Abroad: (Subject) (1-3; max total 6)
Open only to students in California State Colleges International Study Program.

Int St 192. Projects in Study Abroad: (Subject) (1-3; max total 6)
Open only to students in California State Colleges International Study Program.

Int St 292. Projects in Study Abroad: (Subject) (1-3; max total 18)
Prerequisite: admission to a master's degree program. (See section on *California State Colleges—International Study Programs—Graduate Students.*)

Int St 293. Contemporary America (3)
Open only to students from abroad. Prerequisite: graduate standing or permission of instructor. Seminar including studies from areas of anthropology, economics, history, literature, political science, psychology, sociology, and related fields. (See *Foreign Students—Graduate Students.*)

AGRICULTURE DIVISION

Division Head and
Dean of Farm School ..... Lloyd Dowler
Farm Manager ..... George F. Ilg

Department	*Chairman*
Agricultural Mechanics	Clarence D. Jensen
Animal Science	Jesse T. Bell
Plant Science	Wayne E. Biehler

The Agriculture Division provides degree and nondegree curricula preparatory to professions and occupations in agriculture and related fields. For information concerning preveterinary medicine, see *Preprofessional Preparation.* The college farm is organized and operated to provide experience and practical training. Eleven hundred and ninety acres serve as a laboratory and production unit where students carry on supervised farming programs in animal and plant science. In addition, livestock, vineyards, orchards, and crop land are maintained for laboratory use. For information on supervised projects see *Animal and Plant Science Departments.*

The division offers programs leading to the bachelor of science degree in agriculture with eleven specialized majors and in agricultural engineering; three-year technical curricula for students not desiring degree or transfer credit; an agriculture minor; short courses for those not enrolled in the college program but engaged in farming or allied occupations.

Students desiring to qualify for teaching credentials should consult the head of the Agriculture Division or credential advisers. For revised credential structure, see *Education Division.*

Graduate students may obtain nine units of graduate credit in agriculture for use on the master of arts degree in education.

Agriculture 64
Agricultural Engineering
General Agriculture
Agricultural Mechanics 68
Agribusiness
Agricultural Mechanics
Animal Science 71
Agribusiness
Animal Husbandry
Dairy Science
Poultry Husbandry
Plant Science 79
Agribusiness
Agricultural Inspection and Services
Agronomy
Horticulture
Ornamental Horticulture
Viticulture and Enology

AGRICULTURE DIVISION

BACHELOR OF SCIENCE DEGREE IN AGRICULTURE

The bachelor of science degree in agriculture is granted upon completion of a four-year curriculum consisting of 128 semester units selected from one of the major programs. The general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*). The required agricultural courses for majors along with other requirements, are listed in departments as follows: *Agricultural Mechanics Department*—agribusiness, agricultural mechanics; *Animal Science Department*—agribusiness, animal husbandry, dairy science, poultry husbandry; *Plant Science Department*—agribusiness, agricultural inspection and services, agronomy, horticulture, ornamental horticulture, viticulture and enology. Requirements for the general agriculture major are listed below.

BACHELOR OF SCIENCE DEGREE IN AGRICULTURAL ENGINEERING

The bachelor of science degree in agricultural engineering requires 132 units (see *Engineering Department*) and the completion of the general requirements for the bachelor of science degree (see *Degrees and Credentials*). The required agriculture courses follow a selected pattern approved by the head of the Agriculture Division.

BACHELOR OF SCIENCE DEGREE IN AGRIBUSINESS

The bachelor of science degree with a major in agribusiness is granted upon completion of a four-year curriculum consisting of 128 semester units selected from one of the agribusiness major options in the *Agricultural Mechanics*, *Animal Science*, or *Plant Science Departments*, or the *Business Division*. The general education and general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*).

The agribusiness curriculum prepares students in agriculture and business for positions in operations involved in the manufacture of supplies needed on the farm, production operations on the farm, and the storage, distribution, and merchandizing of agricultural commodities.

TECHNICAL AGRICULTURE

Any student who has graduated from high school may make application for admission to the technical agriculture program. Admission to this program is dependent upon a reasonable score on the entrance examination (as determined by appropriate college officials) and approval of the head of the Agriculture Division. Technical agriculture programs stress technical and practical training appropriate to the San Joaquin Valley and include maximum laboratory use of the college farm. Students may take production programs in fattening of livestock, growing of crops, and management of breeding herds, flocks, vineyards, and orchards and are employed so far as possible to assist with the operation of the college farm.

Students qualify for the three-year technical agriculture certificate upon completion of the required general education and related courses and one of the technical majors in the *Agricultural Mechanics*, *Animal Science*, or *Plant Science Departments*, with additional selected production courses to make a total of 84 units. Approved nonagriculture courses open to restricted technical students: Math 27, 28; Bus Ad 27; Off Ad 1; Engl A, 1, 6; Spch 21; Sp Corr 1X; Hist. 1, 10; Pol Sc 11; Biol 1A, 1B; H Ed 90, 91; PE 10-50 (activities); Mus 1 (activities); Psych 7; other specified courses required in the program.

Technical agriculture students enroll in regular agriculture courses with special arrangements to meet their needs. Students admitted to the technical agriculture program who wish to transfer to the degree program may petition the Admissions Committee for such transfer after completing two semesters at Fresno State College with a C average or better.

MINOR

A minor in agriculture is available to degree students in other departments and may be selected from one of the specialized agriculture fields. The minor consists of 20 units of which 12 are upper division.

GENERAL AGRICULTURE MAJOR

The general agriculture major prepares students for diversified farming where a knowledge of farm crops, livestock, and farm machinery is necessary. The curriculum is not intended to replace majors in the Division of Agriculture in which students specialize in a single field.

The requirements are flexible and especially well adapted to meet the needs of students interested in teaching vocational agriculture. Many graduates have found positions with county, state, and federal agencies, or in business and services related to agriculture.

Major Requirements

General agriculture majors must complete a minimum of 47 units (18 units upper division) including 15 units in animal science (AH, DS and/or PH), 15 units in plant science (CP, H, OH and/or V), 6 units in agricultural mechanics; and Ag 1, 112, 130, 136. The selection of courses in each of the respective departments is worked out with the student's major adviser.

Additional Requirements

In addition, general agriculture majors must complete the following courses: Biol 1A or B, 120, Bot 1 or Zool 1; Chem 2A-B, 8; Econ 1A; Math B or equivalent. A total of 128 semester units including general education is required for the bachelor of science degree.

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 total to 15-17 units per semester. A total of 128 units is required for the bachelor of science degree. (See *Degrees and Credentials.*)

General Agriculture

1st Year: Ag 1, Chem 2A-B, Biol 1B, AgM electives, plant and animal science electives
2nd Year: Bot 1, Econ 1A, Chem 8, AgM elective, animal and plant science electives
3rd Year: Ag 130, 136, Biol 120, Math B, animal and plant science electives (u.d.)
4th Year: Ag 112, animal and plant science electives (u.d.)

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

Courses

Note: Active immunization against tetanus (available through the Student Health Service) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the College Farm.

AGRICULTURE

Ag 1. Agricultural Orientation (1)

Survey of agriculture and its related agencies; job opportunities.

Ag 13. Pest Control (3)

Survey of the pest control field; insects, plant diseases, rodents, and weeds of importance in agriculture and around the home; methods, materials, and equipment used for their control. (2 lecture, 3 lab hours)

Ag 31. Agricultural Economics (3)

Prerequisite: Econ 1A. Farm credit, taxation, marketing and commodity problems; government agencies and farm price structures.

Ag 40. Project Records (1)

For students planning to sign up for a project; may be taken concurrently. Organization of the Agricultural Foundation; budgets, contracts, and records needed to conduct an agricultural project under college supervision. (See *Supervised Projects* in the Animal and Plant Science Departments.)

Ag 105. Plant Quarantine Laws (3)

For students interested in county, state, or federal inspection work. Federal, California state, and county laws relating to plant quarantine to prevent the introduction and spread of agricultural pests as outlined in the *California Agricultural Code.*

Ag 106. Economic Entomology (3) (Same as Ent 106)

Prerequisite: Biol 1A or B. General and economic entomology; taxonomy of the principal orders of insects; life histories, habits, recognition, and control of some of the principal agriculture insect pests of the San Joaquin Valley. (2 lecture, 3 lab hours, field trips)

Ag 112. Farm Management (3)

Prerequisite: junior standing. Survey of farm management; basic economic principles relating to farm management; organizing the individual farm unit; balancing crop and livestock enterprises; farm business administration. (2 lecture, 3 lab hours)

Ag 113. Apiculture (2)

Fundamentals of beekeeping; manipulation of the hive; diseases and enemies of bees; nectar sources and pollination problems; production and marketing of honey and beeswax; laws and regulations pertaining to beekeeping. (1 lecture, 3 lab hours)

Ag 114. California Fruit and Vegetable Standards (3)

For students interested in government fruit inspection. California laws and enforcement of regulations for packing or shipping fruits, nuts and vegetables. (2 lecture, 3 lab hours)

Ag 130. Plant Pathology (4) (Same as Bact 130)

Prerequisite: Bot 1. Nature, cause, and control of plant disease in economic agriculture plants. (2 lecture, 6 lab hours)

Ag 136. Soils (3)

Physical and chemical properties of soils influenced by climate, parent material, topography, organisms, and time; use, interpretation and evaluation of soil practices and research, including soil maps, field experiments, fertilizers, physical and chemical analysis. (2 lecture, 3 lab hours; one Saturday field trip)

Ag 146. Irrigation (3)

Methods of irrigation adapted to the San Joaquin Valley; water requirements of various crops and methods of application. (2 lecture, 3 lab hours; 1 Saturday field trip)

Ag 151. Farm Accounting (3)

Prerequisite: Econ 1A, Bus Ad 27, or permission of instructor. Farm accounting systems, farm records, budgets, income tax returns. (2 lectures, 3 lab hours)

Ag 159. Spray Materials (3)

Prerequisite: Chem 2A-B. Development of agricultural chemical industry; chemical properties of compounds used as insecticides, fungicides, rodenticides and herbicides; formulations, regulations and typical uses of these materials. (2 lecture, 3 lab hours)

Ag 180. Special Problems (1-4; max total 4)

Open to juniors or seniors with permission of instructor. May not be substituted for course requirements in major. Exploratory work on a suitable agricultural problem in animal science, plant science, or agricultural mechanics.

Ag 182. Soil Management (3)

Prerequisite: Ag 136 or equivalent, Chem 2A-B. Factors affecting soil fertility, management of soils, attaining continuous maximum productivity. Physical, chemical and field tests on soil fertility, crop and livestock soil management. (2 lecture, 3 lab hours; one week-end field trip)

Ag 184. Advanced Irrigation (3)

Prerequisite: Ag 146 or equivalent. Evaluation of the equipment design, operation, soil and crop response of methods of irrigation, sprinkler methods; pipe line and other methods featuring water control, soil and water conservation. (2 lecture, 3 lab hours; one week-end field trip)

Ag 186. Methods of Teaching General Agriculture (3)

Prerequisite: A Ed 105; S Ed 163 or permission of instructor. Philosophy and teaching techniques in general agriculture; organization of teaching materials; professional standards for teachers.

Ag 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

Ag 280. Seminar in Agriculture (3; max see below)

Maximum total credit 9 units in any given area or any combination of the three areas. Prerequisite: bachelor's degree in agriculture or permission of instructor. Advanced problems in agriculture; research and experimentation in a selected area: animal science, plant science, or agricultural mechanics.

Ag 290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

AGRICULTURAL MECHANICS DEPARTMENT

(In the Agriculture Division)

Principal Vocational Instructor: C. Jensen (Chairman)
Intermediate Vocational Instructor: DeTar, Keck

The Agricultural Mechanics Department offers majors in agribusiness and agricultural mechanics for students who wish to qualify for positions in such fields as farm equipment sales and service, farm structures, rural electrification, teaching vocational agriculture, and farming. Students are trained in the selection, operation, construction, maintenance, and repair of equipment and structures used in modern agriculture.

The *agribusiness major* with an option in agricultural mechanics prepares students for positions in areas such as farm machinery and equipment sales; appraising for insurance companies and banks; management, credit, accounting and other office work; and general farming.

The Agricultural Mechanics Building and the Farm Machinery Center located adjacent to it provide excellent laboratory facilities. The production of hay, cotton, corn, grain crops, grapes, and fruit provides excellent opportunities for a study of farm machinery equipment under varied conditions. The entire College Farm is used as a working laboratory.

Students majoring in *agricultural engineering* enroll under the *Engineering Division.* A minimum of 23 units in agricultural mechanics and agriculture is included in the program.

MAJOR REQUIREMENTS

Agribusiness (Agricultural Mechanics Option) *Units*

BS Degree Major: AgM 15, 17, 18A, 25, 81, 91, 111, 115A-B, 151A-B, 158, 159; Ag 1, 31, 112, 136, 146, 182 or 184; Acct 1A-B; Mkt 100; Bus Ad 102, 110, 118A-B, 133, 151; business elective (3 u.d.) 74

Agricultural Mechanics

BS Degree Major: AgM 15, 17, 18A-B, 25, 81, 91, 111, 115A-B, 121, 151A-B, 158, 159; Ag 1, 136, 146, 151 42

Technical Certificate: AgM 15, 17, 18A-B, 25, 81, 111, 115A-B, 121; Ag 1, 31, 40, 146, 151; AgM elective (2 un) 33

Additional Requirements—BS Degree

In addition to major requirements, degree students (except agribusiness) must complete the following courses: Physics 2A-B; animal science and/or plant science electives (6 un); IA 74; Econ 1A; Biol 1A or B; Math B, C. Agribusiness majors take Biol 1A or B, Physics 2A-B, Econ 1A-B, Math B, C. A total of 128 semester units including general education is required for the bachelor of science degree.

Additional Requirements—Technical Certificate

Technical students must complete in addition to the major requirements, the following courses: Bus Ad 27; animal science and/or plant science electives (10 un); Hist 10, Pol Sc 11; Biol 1A or B; PE (4 semesters); H Ed 90 or 91; Engl 1; Spch 21. A total of 84 semester units is required for the technical certificate.

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 total to 15-17 units per semester. A total of 128 units must be completed for the bachelor of science degree. (See *Degrees and Credentials.*)

Agribusiness (Agricultural Mechanics Option)

1st Year: Ag 1, AgM 15, 17, 18A, Math B, C, Biol 1A or B
2nd Year: AgM 25, 81, 91, Acct 1A-B, Econ 1A-B, Physics 2A-B
3rd Year: Ag 31, 136, AgM 111, 115A-B, 159, Bus Ad 102, 110, 118A-B, 133
4th Year: Ag 112, 146, 182 or 184, AgM 151A-B, 158, Bus Ad 151, Mkt 100, business elective (3 u.d.)

Agricultural Mechanics

1st Year: Ag 1, AgM 15, 17, 18A, Biol 1A or B, Math B, C
2nd Year: AgM 25, 18B, 81, 91, Physics 2A-B, Econ 1A
3rd Year: Ag 136, 146, AgM 111, 115A-B, IA 74, animal or plant science electives
4th Year: Ag 151, AgM 121, 151A-B, 158, 159

Courses

Note: Active immunization against tetanus (available through the Student Health Service) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the College Farm.

AGRICULTURAL MECHANICS

AgM 15. Agricultural Mechanics (2)

Mechanical skills in field of agriculture; selection, care and use of common farm tools; projects of wood and metal in farm appliances. (1 lecture, 3 lab hours)

AgM 17. Farm Tractors (2)

Operation and maintenance of farm tractors; operation of farm tractor under field conditions; service, maintenance and minor repair of gas, diesel, and butane type engines of wheel and crawler type. (1 lecture, 3 lab hours; and total of 5 hours of field operation.)

AgM 18A-B. Agricultural Welding (2-2)

Prerequisite or concurrently: AgM 15. (A) Arc and oxyacetylene welding as a tool of construction and repair in the farm shop; brazing; building up worn parts; burning with hand torch. (B) Hard facing by arc and gas welding; AC and DC welding and application to farm construction and repair; welding projects and farm appliances. (1 lecture, 3 lab hours)

AgM 25. Agricultural Drafting (2)

May be taken concurrently with AgM 15. Use of drafting instruments, lettering, dimensioning, scale drawings and working drawings of projects in agricultural mechanics; elementary plan and perspective drawings of small buildings. (1 lecture, 3 lab hours)

AgM 81. Farm Structures and Equipment (2)

Prerequisite: AgM 15. Construction and repair of farm structures and equipment; farm carpentry and construction principles; engineering principles, codes; farmstead layouts and basic requirements of farm structures. (1 lecture, 3 lab hours)

AgM 91. Farm Surveying (2)

Prerequisite: sophomore standing or permission of instructor. Use of the steel tape, level, transit and compass; field problems in chaining distances, laying out building lines, profile leveling for irrigation ditches and drains, land leveling, and measuring land areas. (1 lecture, 3 lab hours)

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AgM 111. Rural Electrification (2)

Prerequisite: junior standing. Fundamentals of alternating current, wiring practices, circuit layouts and problems, motor and branch circuit protection; safe use of electricity; wiring of farmstead.

AgM 111L. Rural Electrification Laboratory (1)

Laboratory experiments to accompany AgM 111. (3 lab hours)

AgM 115A-B. Farm Machinery (2-2)

Prerequisite: AgM 15. (A) Study and operation of tillage tools, interaction of the soil and tool; cotton, grain, and specialized harvesting machinery and equipment. (B) Orchard and field spraying equipment, field and row crop planters, cultivating tools, and haying machinery. (1 lecture, 3 lab hours)

AgM 121. Advanced Agricultural Welding (2)

Prerequisite: AgM 18A-B. Arc and gas welding processes in construction and repair of farm equipment; inert arc welding; radiograph and shape burning; aluminum and stainless steels; welding tests and design of welded structures. (1 lecture, 3 lab hours)

AgM 151A-B. Farm Power (2-2)

Prerequisite: AgM 15. (A) Principles of the internal combustion engine; adjusting, servicing, and minor repairs practical in farming operations. (B) Overhauling and repairing of gasoline and diesel farm tractors and engines; field servicing and repairing of auxiliary power plants on farm machinery. (1 lecture, 3 lab hours)

AgM 158. Unit Operations I (3) (See V 158A)

AgM 159. Pumps and Motors (3)

Prerequisite: AgM 15, Ag 146. 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)

AgM 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

ANIMAL SCIENCE DEPARTMENT

(In the Agriculture Division)

Principal Vocational Instructor: Bell (Chairman), Hixson, Ilg, Rousek, Selkirk, W. E. Smith (p-t)

Senior Vocational Instructor: Ball

Intermediate Vocational Instructor: Pflueger, Verdugo

Junior Vocational Instructor: Heckman, D. Nelson

Part-time: Larson

The Animal Science Department offers majors in agribusiness, animal husbandry, dairy husbandry, dairy industry, and poultry husbandry.

The *agribusiness* major with an option in animal science prepares students for positions in areas such as agricultural sales, including veterinary supplies, feeds; appraising for insurance companies and banks; management, credit, accounting and other office work; and general farming.

The *animal husbandry* major prepares students for occupations in farming where beef cattle, sheep, swine and horse enterprises are an important part of the industry. Many graduates in this department are engaged in the livestock and farming business or in other agribusiness occupations. The department maintains purebred herds of Hereford, Shorthorn and Angus beef cattle; a purebred flock of Rambouillet, Columbia, and Hampshire sheep; four breeds of swine—Berkshire, Hampshire, Yorkshire, and Duroc; and a complement of registered quarter horses.

The *dairy science major with dairy husbandry option* trains students for commercial dairy farming enterprises, dairy herd management, milk testing, fieldwork for breeding associations, dairy sanitation, and for other agribusiness occupations. The department maintains three breeds of purebred dairy cattle—Holsteins, Guernseys, and Jerseys. A Grade A dairy barn, dry feed lots, bull barn, fitting and showing barn, and a cow and calf barn provide excellent facilities for practical training in dairy husbandry.

The *dairy science major with dairy industry option* prepares students for jobs in dairy plants in processing milk, ice cream, cheese, butter, and other dairy products. The college maintains its own processing plant for bottling milk and teaching the required courses in butter making, ice cream, cheese, and dairy plant management. Dairy products are processed for the college cafeteria and retail sales store by students as a part of the practical training program.

The *poultry husbandry* major prepares students for occupations in commercial egg production, fryer operations, breeder flock management, hatchery, processing, and sales positions with feed companies. Many graduates operate their own turkey and poultry farms. The poultry plant includes a central hatchery with cold storage facilities for egg handling, grading and candling; commercial egg production and pedigree pens; brooding facilities for conventional type houses along with sunshine brooders; intermediate growing batteries and wire floor cage houses. Over 3,000 birds are maintained in the college flock.

SUPERVISED PROJECTS

The agriculture program is unique in that it provides opportunity for students to gain both theoretical training and practical experience in farming while pursuing their college programs. The supervised project experience is designed to supplement the lecture and laboratory assignments, giving students greater opportunity to develop the practical side of farming. The college owns all of the necessary equipment for student projects. A rental fee is charged for use of equipment. Proficiency in operating equipment must be demonstrated before projects may be undertaken. Students sign contracts with the Fresno State College Agricultural Foundation

wherein they agree to perform the labor required in caring for their projects. The Agricultural Foundation serves as a banking agency in providing the money a student will or may need for project materials. Students must submit records on each enterprise to the Agricultural Foundation and share the profit or loss with the Foundation according to established percentages. Completion of a one-unit course, Ag 40, Project Records, is required either prior to or concurrently with a project.

In the Animal Science Department, some students feed out steers, lambs, and pigs. Others have fryer, turkey, or commercial egg production projects. Students may bring lambs or steers from their home farms and feed them out at the college, provided feed is purchased from the college feed mill and a pen rental fee is paid monthly.

MAJOR REQUIREMENTS

Units

Agribusiness (Animal Science Option)

BS Degree Major: Ag 1, 31, 112, 136, AH 71, 116, 172; Acct 1A-B, Mkt 100, Bus Ad 102, 110, 118A-B, 133, 151, business electives (3 u.d.); elect two of the following animal science fields—animal husbandry (AH 1, 22, 30, 40), dairy husbandry (DS 11A-B, 53, 102), dairy industry (DS 11B, 53, 156, 165), poultry husbandry (PH 1, 32, 162, 163) 73

Animal Husbandry

BS Degree Major: AH 1, 2, 22, 30, 40, 71, 106, 115, 116, 172; Ag 1, 112, 136, 151; AH electives (4 un) 43

Technical Certificate: AH 1, 2, 22, 25, 30, 40, 71, 172; Ag 1, 31, 40, 151; AH electives (5 un) 36

Dairy Science (Dairy Husbandry Option)

BS Degree Major: DS 11A-B, 53, 55, 56, 102, 106, 165; Ag 1, 136, 151; AH 71, 115, 116, 172; DS elective (2 un) 43

Technical Certificate: DS 11A-B, 53, 55, 56, 102, 106, 108; Ag 1, 31, 40, 151; AH 71, 172 35

Dairy Science (Dairy Industry Option)

BS Degree Major: DS 11A-B, 53, 58, 103, 104, 107, 151, 154, 156, 165, 185, 189; Ag 1 37

Technical Certificate: DS 11A-B, 53, 55, 58, 103, 104, 107, 189; Ag 1, 31, 40, 151 32

Poultry Husbandry

BS Degree Major: PH 1, 32, 34, 161, 162, 163, 164, 181, 182; Ag 1, 136, 151; AH 115, AH or DS electives (8 un) 44

Technical Certificate: PH 1, 32, 34, 161, 162, 163, 164, 182; Ag 1, 31, 40, 151; AH or DS electives (3 un) 34

Additional Requirements—BS Degree

In addition to major requirements, degree students must complete the courses indicated below for each program. A total of 128 semester units including general education is required for the bachelor of science degree.

Agribusiness (Animal Science Option): Biol 1B; Chem 2A-B, 8; Econ 1A-B.

Animal Husbandry: Bact 20; AgM electives (6 un); Zool 1; Chem 2A-B, 8; Biol 1A, 120; Econ 1A; Bus Ad 27 (or Math B or equivalent).

Dairy Science (Dairy Husbandry Option): Bact 20; AgM electives (6 un); Zool 1; Chem 2A-B, 8; Biol 1A, 120; Econ 1A; Bus Ad 27 (or Math B or equivalent).

Dairy Science (Dairy Industry Option): Bact 20; AgM electives (6 un); Zool 1; Chem 2A-B, 8; Biol 1A; Econ 1A; Bus Ad 27 (or Math B or equivalent), 110; Acct 1A.

Poultry Husbandry: Bact 20; AgM electives (6 un); Zool 1; Chem 2A-B, 8; Biol 1A, 120; Econ 1A; Bus Ad 27 (or Math B or equivalent).

Additional Requirements—Technical Certificate

Technical students must complete, in addition to the major requirements, the following courses. A total of 84 semester units is required for the technical certificate.

AgM electives (6 un), animal science and/or plant science electives (10 un), Bus Ad 27, Hist 10, Pol Sci 11, Biol 1A or B, Engl 1, Spch 21, PE (4 semesters), H Ed 90 or 91.

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 total to 15-17 units per semester. A total of 128 units is required for the bachelor of science degree. (See *Degrees and Credentials.*)

Agribusiness (Animal Science Option)

1st Year: Ag 1, Biol 1B, Chem 2A-B, animal science electives
2nd Year: AH 71, 172, Acct 1A-B, Chem 8, Econ 1A-B, animal science electives
3rd Year: Ag 31, 136, AH 116, Bus Ad 102, 110, 118A-B, 133
4th Year: Ag 112, Bus Ad 151, Mkt 100, business and animal science electives

Animal Husbandry

1st Year: Ag 1, AH 1, 2, Biol 1A, Bus Ad 27, Chem 2A-B, AgM electives
2nd Year: AH 22, 71, 172, Chem 8, Econ 1A, Zool 1, AH and AgM electives
3rd Year: Ag 136, AH 30, 115, 116, Bact 20, Biol 120
4th Year: Ag 112, 151, AH 40, 106, AH electives

Dairy Science (Dairy Husbandry Option)

1st Year: Ag 1, DS 11A-B, Bus Ad 27, Biol 1A, Chem 2A-B, AgM electives
2nd Year: AH 71, 172, DS 53, 55, 56, Chem 8, Econ 1A, Zool 1, AgM elective
3rd Year: Ag 136, AH 115, 116, Bact 20, Biol 120
4th Year: Ag 151, DS 102, 106, 165, DS elective

Dairy Science (Dairy Industry Option)

1st Year: Ag 1, DS 11A-B, Biol 1A, Chem 2A-B, AgM electives
2nd Year: DS 53, 107, Bus Ad 27, Chem 8, Econ 1A, Zool 1, AgM elective
3rd Year: DS 58, 103, 104, Acct 1A, Bact 20, Bus Ad 110
4th Year: DS 151, 154, 156, 165, 185, 189

Poultry Husbandry

1st Year: Ag 1, PH 1, 34, Biol 1A, Chem 2A-B, AgM electives
2nd Year: PH 32, Bus Ad 27, Chem 8, Econ 1A, Zool 1, AgM elective
3rd Year: Ag 136, AH 115, PH 161, 163, 164, Bact 20, Biol 120
4th Year: Ag 151, PH 162, 181, 182, AH or DS electives

Courses

Note: Active immunization against tetanus (available through the Student Health Service) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the College Farm.

ANIMAL HUSBANDRY

AH 1. Introduction to Animal Husbandry (3)

Types and breeds of farm animals in the United States and their adaptation under various conditions; preview of production methods common to livestock enterprises. (2 lecture, 3 lab hours)

AH 2. Livestock Selection (2)

Prerequisite: AH 1. A beginning course in judging market and breeding classes of beef cattle, swine, sheep, and horses. (1 lecture, 3 lab hours)

AH 3. Livestock Judging (2)

Prerequisite: AH 1, 2. Follows AH 1 and 2 in judging market and breeding classes of beef cattle, swine, sheep, and horses. (1 lecture, 3 lab hours)

AH 10. Slaughtering and Meat Cutting (3)

Prerequisite: AH 1. Slaughtering of farm meat animals; cutting of carcasses into wholesale and retail cuts; related meats material. (2 lecture, 3 lab hours)

AH 22. Beef Husbandry (3)

Prerequisite: AH 1. Management of purebred and commercial beef herds; selection of breeding stock; management practices in fattening cattle; marketing of slaughter and purebred cattle. (2 lecture, 3 lab hours)

AH 25. Fitting and Showing Livestock (3)

Prerequisite: AH 1. Techniques in selecting, fitting, and showing livestock; classification and entrance requirements for shows; rules, regulations, fair management, sales organization. (2 lecture, 3 lab hours)

AH 30. Swine Husbandry (3)

Prerequisite: AH 1. Principles and practices of purebred and commercial swine husbandry; breeding, feeding, and management program. (2 lecture, 3 lab hours)

AH 40. Sheep Husbandry (3)

Prerequisite: AH 1. Breeding, feeding management, and marketing of commercial and purebred sheep; breeds, setting up a program of breeding, housing, and equipment requirements; feeding and care of ewes and lambs; docking; castrating; shearing, tying, sacking, and storing the wool. (2 lecture, 3 lab hours)

AH 50. Horse Husbandry (3)

Prerequisite: AH 1, 2. Breeds, selection, care, and feeding of light horses; their use and place in the agriculture of California. (2 lecture, 3 lab hours)

AH 71. Feeds and Feeding (3)

Prerequisite: AH 1, Chem 2A-B, Biol 1A or B. Composition and nutritive value of livestock feeds and their utilization by the farm animal body; processes of digestion and assimilation; feeding standards and basic principles of feeding farm animals.

AH 73. Feed Mill Management (2)

Prerequisite: AH 71 or PH 32. Operation and maintenance of feed mills; compiling rations; mixing, buying and selling feeds; participation in management and operation of college feed mill. (1 lecture, 3 lab hours)

AH 103. Advanced Livestock Judging (2)

Prerequisite: AH 2, 3, or permission of instructor. Livestock judging preparing individuals to better select animals according to breed types and characteristics. Trips to intercollegiate judging contests. (1 lecture, 3 lab hours)

AH 106. Animal Breeding (3) (Same as DS 106)

Prerequisite: Biol 120, AH 1 or DS 11A. Principles of physiology and heredity as applied to the breeding of farm animals; application of genetics to a livestock breeding program.

AH 115. Anatomy and Physiology of Farm Animals (3)

Prerequisite: Zool 1, Chem 8. General structures of farm animals and physiological functions of organs of the animal body. (2 lecture, 3 lab hours)

AH 116. Livestock Sanitation and Diseases (3)

Prerequisite: AH 115. Sanitation practices and use of disinfectants; cause, symptoms, prevention, and treatment of common diseases of livestock. (2 lecture, 3 lab hours)

AH 122. Advanced Beef Production (3)

Prerequisite: AH 22. Study of research material in breeding, nutrition, diseases and management; records of performance, pedigrees, purebred sales and show herd management. (2 lecture, 3 lab hours; 1 week-end field trip)

AH 133. Market Swine Production (3)

Prerequisite: AH 1, 30. Types, market classes, and grades of swine; food demands, building and equipment requirements, marketing methods, and management problems in market swine production. (2 lecture, 3 lab hours)

AH 143. Advanced Sheep and Wool Technology (3)

Prerequisite: AH 40, Chem 2A-B, 8. Research material in breeding, nutrition, diseases, progeny and performance testing; carcass quality improvement and economics of sheep industry; testing techniques in wool technology, grade and other physical measurements, properties and characteristics determining value; role of wool in world trade. (2 lecture, 3 lab hours; 2 field trips)

AH 150. Advanced Horse Husbandry (3)

Prerequisite: AH 1, 50. Advanced principles of horse husbandry including management of horse breeding farms, breeding systems, training and selling horses, and western equitation. (1 lecture, 6 lab hours; 1 week-end field trip)

AH 170. Animal Husbandry Seminar (1; max total 2)

Open to seniors majoring in animal husbandry. Latest developments in research; assigned research papers in animal husbandry to be presented in both oral and written form.

AH 172. Animal Nutrition (3)

Prerequisite: AH 71, Chem 8, or permission of instructor. Principles of animal nutrition; nutritive requirements for growth, fattening, reproduction, lactation and other body functions of farm animals; relationship of malnutrition and deficiency diseases to livestock production.

AH 175. Grading and Marketing Livestock (3)

Prerequisite: AH 1, 2. Grading live and dressed carcasses; determining cut-out values for beef, sheep, and swine. (2 lecture, 3 lab hours; field trips to central markets)

AH 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

DAIRY SCIENCE

DS 11A-B. Introduction to Dairying (3-3) (Former DH 11A-B)
A general survey of the growth and development of dairying. (A) Principles and practices in the production of milk; basic feeding, management, and disease control practices. (B) Basic principles of dairy industry practices; common dairy tests; general survey of all important branches of the industry. (2 lecture, 3 lab hours)

DS 53. Market Milk (3) (Former DI 53)
Prerequisite: DS 11A-B or permission of instructor. Principles of market milk production, processing and distribution; modern processing methods and equipment. (2 lecture, 3 lab hours)

DS 55. Dairy Cattle Judging (2) (Former DH 55)
Prerequisite: DS 11A. Judging dairy cattle on type and conformation; comparative judging of cattle in college herd and outstanding dairy herds in the San Joaquin Valley. (1 lecture, 3 lab hours)

DS 56. Dairy Cattle Selection (2) (Former DH 56)
Correlation of production and pedigree records together with type classifications in selection of dairy cattle. (1 lecture, 3 lab hours)

DS 58. Judging Dairy Products (2) (Former DI 108)
Prerequisite: DS 11A-B. Practice in scoring and grading dairy products; methods of control of defects. (1 lecture, 3 lab hours)

DS 73. Dairy Plant Practice (3) Summer only (Former DI 73)
Open only to dairy industry majors. Prerequisite: DS 11A-B or permission of instructor. Six weeks of practical experience or its equivalent in an approved dairy processing plant. Written reports required.

DS 102. Dairy Farm Management (3) (Former DH 102)
Prerequisite: DS 11A-B 55, 56, Econ 1A. Problems in management of a dairy farm; marketing problems and factors in controlling milk secretion. (2 lecture, 3 lab hours)

DS 103. Butter Making (3) (Former DI 103)
Prerequisite: DS 53 or permission of instructor. Production, grading, and marketing of cream for butter; manufacture and marketing of butter; modern equipment used in manufacturing and packaging. (2 lecture, 3 lab hours)

DS 104. Cheese Making (3) (Former DI 104)
Prerequisite: DS 53 or permission of instructor. Methods of manufacturing common varieties of cheese; types of cheese common to the San Joaquin Valley. (2 lecture, 3 lab hours)

DS 105. Advanced Dairy Cattle Judging (2) (Former DH 105)
Prerequisite: DS 55, 56. Advanced practice in comparative judging and selection of dairy cattle; detailed scoring of cattle and practice in justifying comparative placing. Trips to intercollegiate judging contests. (1 lecture, 3 lab hours)

DS 106. Animal Breeding (3) (See AH 106) (Former DH 106)

DS 107. Ice Cream Making (3) (Former DI 54)
Open only to juniors and seniors. Prerequisite: DS 53 or permission of instructor. Basic principles of formulating ice cream mixes; freezing and storage of ice cream, sherbets, and ices; modern freezing, packaging, and storage facilities in the San Joaquin Valley. (2 lecture, 3 lab hours)

DS 108. Selecting, Fitting and Showing Dairy Cattle (2) (Former DH 108)
Prerequisite: DS 11A-B, 55. Techniques in selecting and fitting dairy cattle for shows and sales; entrance requirements for dairy cattle in California fairs and shows. (1 lecture, 3 lab hours)

DS 110. Artificial Insemination (2) (Former DH 110)
Prerequisite: DS 11A, Biol 120, AH 115. Basic principles of artificial insemination of dairy cattle; semen collection, processing, evaluation and use. (1 lecture, 3 lab hours)

DS 151. Dairy Bacteriology (3) (Same as Bact 151) (Former DI 151)
Prerequisite: Bact 20. Bacteria, yeasts, and molds in manufacture of dairy products. (2 lecture, 3 lab hours)

DS 154. Dairy Plant Management (3) (Former DI 154)
Prerequisite: DS 103, 104, 107, Acct 1A. Application of principles of management to dairy manufacturing plants; cost accounting, selling, advertising, and labor problems; current local problems.

DS 156. Marketing Dairy Products (3) (Former DI 156)
Prerequisite: DS 103, 104, 107, Acct 1A. Principles of purchasing and marketing dairy products; products of the San Joaquin Valley.

DS 165. Dairy Inspection (3) (Former DI 165)
Prerequisite: DS 11A-B. Methods of scoring and grading dairy farms, milk plants, and creameries; California Agricultural Code as it applies to dairies and dairy plants; tests and their application to control work. (3 lecture hours; 3 3-hour field trips)

DS 185. Advanced Testing (2) (Former DI 185)
Prerequisite: Chem 2A-B, 8. Full operation of the Mojonnier Dairy Products Tester for analyzing all dairy products for fat and total solids. (1 lecture, 3 lab hours)

DS 189. Advanced Dairy Products Judging (2) (Former DI 189)
Prerequisite: DS 58. Product judging; training for participation in judging contest work. Trips to intercollegiate judging contests. (1 lecture, 3 lab hours)

DS 190. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

POULTRY HUSBANDRY

PH 1. Poultry Production (3)
Poultry production; brooding, rearing, laying flocks, feeding, and housing. (2 lecture, 3 lab hours)

PH 32. Poultry Feeding (3)
Prerequisite: PH 1. Poultry feeds and application of principles of nutrition to poultry and turkey feeding. (2 lecture, 3 lab hours)

PH 34. Egg Processing and Marketing (3)
Principles, practices, and problems in processing and marketing shell eggs and egg products. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 161. Turkey Management (3)
Prerequisite: PH 32. Principles and practices in commercial production of turkeys for meat and in turkey breeding. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 162. Poultry Management (3)

Prerequisite: PH 32. Principles and practices in commercial egg production for wire-floored and conventional litter-type housing. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 163. Poultry Products and Processing (3)

Prerequisite: PH 1. Grading, processing, preservation, and marketing of poultry. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 164. Hatchery Management (3)

Prerequisite: PH 1. Hatchery operations, including practical work. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 181. Poultry Breeding (3)

Prerequisite: Biol 120, PH 1. Selection of poultry breeding flocks and application of principles of genetics to poultry breeding. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 182. Poultry Diseases and Sanitation (2)

Prerequisite: PH 1, AH 115. Anatomy and physiology of fowl; poultry diseases. (1 lecture, 3 lab hours)

PH 190. Independent Study (1-3; max see reference)

See Regulations and Procedures—Independent Study.

PLANT SCIENCE DEPARTMENT
(In the Agriculture Division)

Principal Vocational Instructors: Biehler (Chairman), Braun, Petrucci, Strong
Senior Vocational Instructor: LeValley
Intermediate Vocational Instructors: R. D. Harrison, Karle, Van Elswyk
Junior Vocational Instructor: Norton

The Plant Science Department offers majors in agribusiness, agricultural inspection and services, agronomy, horticulture, ornamental horticulture, and viticulture and enology.

The department has excellent facilities for classroom and laboratory work. The agriculture classroom building is well equipped and provides laboratory facilities for soils and irrigation, cotton classing, grains and grasses, horticulture, viticulture, plant disease, and ornamental horticulture. The College Farm includes a 160-acre vineyard, 105 acres of orchard, 15 acres for the nursery, and adequate acreage for cotton, corn, grain, and vegetable crop projects. A part of the College Farm is planted to permanent pasture and hay crops for livestock. The entire 1,190 acres is used as a working laboratory. A horticulture and viticulture packing shed and a raisin processing plant make it possible for students to pack out and process their own fruit, grapes, and raisins grown in the project program.

The *agribusiness* major with an option in plant science prepares students for positions in areas such as agricultural sales, including seeds, fertilizers, insecticides, weedicides, herbicides and fungicides; appraising for insurance companies and banks; fruit, grain, and vegetable buying; management, credit, accounting and other office work in related agricultural industry; and general farming.

The *agricultural inspection and services* major prepares students for job opportunities in civil service positions with county, state, and federal agencies. These agencies employ inspectors to enforce the agricultural laws and regulations which have been established for the protection of various agriculture enterprises. This major will also qualify students for sales positions with chemical and insecticide companies.

The *agronomy* major prepares students for field crop production and for general farming involving combinations of both crops and livestock; for placement in such fields as service and sales in seeds, weed and pest control, and fertilizers; as research assistants; as fieldmen with chemical companies; positions in the Soil Conservation Service; gin managers; for county, state and federal government employment as agronomists; and as farm foremen.

The *horticulture* major prepares students for general fruit farming, managers of orchards, inspectors in fruit processing plants, supervisory positions in fruit packing plants, and for careers with county, state, and federal agencies.

The *ornamental horticulture* major prepares students for the nursery industry, landscaping and grounds work, sales positions, and teacher education in general agriculture.

The *viticulture and enology major with enology option* prepares students for positions in the California wine industry. Typical positions include laboratory technicians, cellar foremen, plant sanitarians, wine chemists, processing department supervisors, production managers, and winery and vineyard fieldmen.

The *viticulture and enology major with viticulture option* prepares students for a wide variety of jobs, such as vineyard foremen, extension assistants, inspectors for raisin plants, grape buyers, field and plant representatives, shipping clerks, salesmen of chemical supplies and insecticides. Many graduates return to farms where they operate their own vineyards.

SUPERVISED PROJECTS

The agriculture program is unique in that it provides opportunity for students to gain both theoretical training and practical experience in farming while pursuing their college programs. The supervised project experience is designed to supplement the lecture and laboratory assignments, giving students greater opportunity to develop the practical side of farming. The college owns all of the necessary equipment for student projects. A rental fee is charged for use of equipment. Proficiency in operating equipment must be demonstrated before projects may be undertaken. Students sign contracts with the Fresno State College Agricultural Foundation wherein they agree to perform the labor required in caring for their projects. The Agricultural Foundation serves as a banking agency in providing the money students may need for the project materials. Students must submit records on each enterprise to the Agricultural Foundation and share the profit or loss with the Foundation according to established percentages. Completion of a one-unit course, Ag 40, Project Records, is required either prior to or concurrently with a project.

In the Plant Science Department, each of the major programs provides opportunity for project participation, usually limited to five-acre plots. Under certain conditions, reduced or expanded acreage may be allowed. Students prepare seed beds, plant, cultivate, irrigate, control insect pests and weeds, and harvest and market their crops, in addition to making all managerial decisions necessary to completion of the enterprise.

MAJOR REQUIREMENTS

Agribusiness (Plant Science Option) *Units*

BS Degree Major: Ag 1, 31, 106, 112, 130, 136, 146, 159, CP 60; elect 12 units from one of the following majors (ag inspection and services, agronomy, horticulture, ornamental horticulture, or viticulture and enology); Acct 1A-B, Mkt 100, Bus Ad 102, 110, 118A-B, 133, 151, business electives (3 u.d.) 68

Agricultural Inspection and Services

BS Degree Major: Ag 1, 13, 105, 106, 113, 114, 130, 136, 151, 159, CP 12, 60, H 12, 57, 181, OH 33, V 11, 50; V 101, Ag 112, or H 112 55

Technical Certificate: Ag 1, 13, 31, 40, 105, 106, 113, 114, 151, 159, CP 12, 60, H 12, 57, OH 33, V 11, 50 46

Agronomy

BS Degree Major: CP 11, 12, 60, 150, Ag 1, 106, 112, 130, 136, 146, 151, Bot 104, CP electives (12 un) 48

Technical Certificate: CP 11, 12, 60, Ag 1, 31, 40 106, 146, 151, CP electives (9 un) 32

Horticulture

BS Degree Major: H 11, 12, 57, 112, 181, 186, Ag 1, 106, 114, 130, 136, 146, 151, Bot 104, V 11 or 16, H elective (3 un) 48

Technical Certificate: H 11, 12, 57, 112, 186, Ag 1, 31, 40, 105, 114, 151, 159, H elective (3 un) 35

Ornamental Horticulture

BS Degree Major: OH 3, 22, 33, 53, 123, 125, 132, 162, 163, Ag 1, 31, 106, 130, 136, 146, 159, Bot 104 51

Technical Certificate: OH 3, 22, 33, 53, 123, 125, Ag 1, 13, 31, 40, 151, 159, H 11 or V 11 35

Viticulture and Enology (Enology Option)

BS Degree Major: V 13, 15, 50, 101, 115, 116, 158A-B, 160, 171, Ag 1, Bact 20 37

Viticulture and Enology (Viticulture Option)

BS Degree Major: V 11, 13, 15, 16, 50, 101, 110, 166, 170, Ag 1, 106, 130, 136, 146, 151, Bot 104, H 11 or 12 48

Technical Certificate: V 11, 13, 15, 16, 50, 101, 110, 166, Ag 1, 31, 40, 106, 151 34

Additional Requirements—BS Degree

In addition to major requirements, degree students must complete the courses indicated below for each program. A total of 128 semester units including general education is required for the bachelor of science degree.

Agribusiness (Plant Science Option): Biol 1A, Bot 104, Chem 2A-B, 8, Econ 1A-B.

Agricultural Inspection and Services: Bact 20, AgM electives (4 un), Bot 1, Chem 2A-B, 8, Biol 1B, Econ 1A.

Agronomy: AgM electives (8 un), Bot 1, Chem 2A-B, 8, Biol 1B, 120, Econ 1A.

Horticulture: Bact 20, AgM electives (6 un), Bot 1, Chem 2A-B, 8, Biol 1B, 120, Econ 1A.

Ornamental Horticulture: Bact 20, AgM electives (4 un), Bot 1, Chem 2A-B, 8, Biol 1B, 120, Econ 1A.

Viticulture and Enology (Enology Option): Acct 1A-B, Bus Ad 110, Chem 2A-B, 8, 105, 109, Econ 1A-B, Biol 1A, Math B, Physics 2A-B, and two semesters of satisfactory collegiate study (or equivalent) in one foreign language.

Viticulture and Enology (Viticulture Option): Bact 20, AgM electives (6 un), Bot 1, Chem 2A-B, 8, Biol 1B, 120, Econ 1A.

Additional Requirements—Technical Certificate

Technical students must complete, in addition to the major requirements, the following courses. A total of 84 semester units is required for the technical certificate.

AgM electives (6 un), Bus Ad 27, animal science and/or plant science electives (10 un), Hist 10, Pol Sc 11, Biol 1A or B, H Ed 90 or 91, PE (4 semesters), Engl 1, Spch 21. *Agricultural Inspection and services* majors are required to complete 4 units of AgM electives. *Agronomy* majors are required to complete 8 units of AgM electives.

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 total to 15-17 units per semester. A total of 128 units is required for the bachelor of science degree. (See *Degrees and Credentials.*)

Agribusiness (Plant Science Option)

1st Year: Ag 1, Biol 1A, Chem 2A-B, plant science electives
2nd Year: Ag 31, CP 60, Acct 1A-B, Chem 8, Econ 1A-B, plant science electives
3rd Year: Ag 106, 136, 146, Bus Ad 102, 110, 118A-B, Bot 104
4th Year: Ag 112, 130, 159, Bus Ad 133, 151, Mkt 100, business elective

Agricultural Inspection and Services

1st Year: Ag 1, 13, CP 12, Biol 1B, Chem 2A-B, AgM electives
2nd Year: CP 60, H 57, OH 33, Bact 20, Bot 1, Chem 8, Econ 1A
Summer: V 50
3rd Year: Ag 105, 106, 136, 159, H 12, V 11
4th Year: Ag 113, 114, 130, 151, H 181; V 101, H 112, or Ag 112

Agronomy

1st Year: Ag 1, CP 11, 12, Biol 1B, Chem 2A-B, AgM electives
2nd Year: Bot 1, Chem 8, Econ 1A, AgM and CP electives
3rd Year: Ag 106, 136, CP 60, Biol 120, Bot 104, CP electives
4th Year: Ag 112, 130, 146, 151, CP 150

Horticulture

1st Year: Ag 1, H 11, 12, Biol 1B, Chem 2A-B, AgM electives
2nd Year: H 57, Bact 20, Bot 1, Chem 8, Econ 1A, AgM and H electives
3rd Year: Ag 106, 114, 136, V 11 or 16, Biol 120, Bot 104
Summer: H 112
4th Year: Ag 130, 146, 151, H 181, 186

Ornamental Horticulture

1st Year: Ag 1, OH 22, Biol 1B, Chem 2A-B, AgM electives
2nd Year: OH 33, 53, Bact 20, Bot 1, Chem 8, Econ 1A
3rd Year: Ag 106, 136, 159, OH 123, 132, Biol 120, Bot 104
4th Year: Ag 31, 130, 146, OH 125, 162, 163

Viticulture and Enology (Enology Option)

1st Year: Ag 1, Biol 1A, Chem 2A-B, Math B, foreign language
2nd Year: V 15, Acct 1A-B, Bact 20, Chem 8, 109, Econ 1A-B
Summer: V 50
3rd Year: V 115, 116, 158A or 171, 158B or 160, Chem 105, Physics 2A-B
4th Year: V 13, 101, 160 or 158B, 171 or 158A, Bus Ad 110

Viticulture and Enology (Viticulture Option)

1st Year: Ag 1, V 11, 16, Biol 1B, Chem 2A-B, AgM electives
2nd Year: V 13, 110, Bact 20, Bot 1, Chem 8, Econ 1A, AgM elective
Summer: V 50
3rd Year: Ag 106, 136, H 11 or 12, V 101, Biol 120, Bot 104
4th Year: Ag 130, 146, 151, V 15, 166, 170

Courses

Note: Active immunization against tetanus (available through the Student Health Service) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the College Farm.

AGRONOMY

CP 11. Introduction to Agronomy (3)

Principles of crop production, survey of important field crops, production methods and major uses in California and the San Joaquin Valley. (2 lecture, 3 lab hours; 2 Saturday field trips)

CP 12. Introduction to Vegetable Crops (3)

Culture of vegetable crops for market and home; importance, varieties, cultivation, harvesting, storing, and marketing; vegetable diseases and insect pests; vegetables grown commercially in the San Joaquin Valley. (2 lecture, 3 lab hours; 2 Saturday field trips)

CP 51. Forage Crops (3)

Prerequisite: CP 11 or permission of instructor. Irrigated forage crops of California as related to livestock enterprises; cultural methods, harvesting, marketing, quality, insect and disease control. (2 lecture, 3 lab hours)

CP 52. Fiber and Oil Crops (3)

Prerequisite: CP 11. Fiber and oil crops, cotton, flax, ramie, castor bean, safflower, common to the San Joaquin Valley; cotton production; varieties and improvement, cultural methods, harvesting and marketing. (2 lecture, 3 lab hours)

CP 53. Cereal Crops (3)

Prerequisite: CP 11. Cereal crops common to the San Joaquin Valley; varieties and cultural practices, harvesting and marketing. (2 lecture, 3 lab hours)

CP 56. Vegetable Field Crops (3)

Prerequisite: CP 12. Methods of production, harvesting, grading, storing, and processing vegetable crops common to the San Joaquin Valley; potatoes, tomatoes, sweet potatoes, carrots, melons, and lettuce. (2 lecture, 3 lab hours; 3-day field trip)

CP 60. Weeds (3)

Prerequisite: CP 11. Weeds common to the San Joaquin Valley and their prevention and control; weed identification and recommended methods of control or prevention. (2 lecture, 3 lab hours; 1 week-end field trip)

CP 103. Seed Production (3)

Prerequisite: CP 11 or permission of instructor. Principles and practices in the culture of vegetable and field crops for seed production; harvesting, storage, yields, quality, seed laws, certification, seed cleaning, and marketing. (2 lecture, 3 lab hours)

CP 105. Cotton Technology (3)

Prerequisite: CP 52 or equivalent. Cotton harvesting, processing, marketing, utilization, and testing; cotton fiber technology. (2 lecture, 3 lab hours)

CP 118. Range Management (3)

Prerequisite: CP 11 or permission of instructor. Identification of range forage; estimating carrying capacity; methods of range conservation, controlled grazing, water development, rodent control, fertilization, reseeding, brush removal; identification of poisonous plants. (2 lecture, 3 lab hours; 1 Saturday field trip)

CP 150. Crop Breeding (3)

Prerequisite: Biol 120. Application of genetic and environmental principles to improvement of crop plants; heredity and variation in crop plants, effects of various environmental factors on crop improvements, effects of self and cross fertilization, principles and results of selection and hybridization in crop improvement. (2 lecture, 3 lab hours)

CP 152. Cotton Classing (2)

Characteristics of classes and grades of cotton; practical work in classing cotton; cotton quality as related to grade, staple, and utilization. (1 lecture, 3 lab hours)

CP 190. Independent Study (1-3; max see reference)

•See *Regulations and Procedures—Independent Study*.

HORTICULTURE

H 11. Introduction to Fruit Growing (3)

Varieties, adaptation, pruning, and cultural requirements of deciduous fruits; harvesting and preparation for market. (2 lecture, 3 lab hours; 16 hours additional pruning practice arranged)

H 12. Fruit Production (3)

Prerequisite: permission of instructor. Production of fruits and nuts in the San Joaquin Valley; spring orchard practices, laying out, planting and planning orchards on the college farm. (2 lecture, 3 lab hours; 2 Saturday field trips)

H 52. Citrus Production (3)

Survey of citrus industry; cultural operations including management practices in budding, planting, grafting, fertilizing, irrigating, controlling diseases, pruning, spraying, and harvesting the crop. (2 lecture, 3 lab hours; one Saturday field trip)

H 55. Subtropical Horticulture (3)

Prerequisite: H 11. Problems in production of citrus fruits, figs, olives, avocados, pomegranates, and persimmons. (2 lecture, 3 lab hours)

H 57. Fruit Varieties (3)

Prerequisite: H 12 or permission of instructor. Characteristic differences of fruit species; varieties produced in the San Joaquin Valley. (2 lecture, 3 lab hours)

H 58. Small Fruit Culture (3)

Cultural practices in production of strawberries and small fruits; berry culture management practices, pruning, planting; insect pest and disease control; practical experience in harvesting, grading, and marketing berries. (2 lecture, 3 lab hours)

H 112. Marketing Fresh Fruit (3) Summer only

Prerequisite: H 11, 12. Practice in harvesting, grading, sorting, and packing fruit; operation of packing house, selection and use of equipment; inspection and marketing of packed fruit. (3-day field trip)

H 181. Fruit Processing (3)

Prerequisite: H 11. Grading of fruits and nuts, packaging, drying, and quick freezing; improvement of produce, laws in maintaining fruit standards. (2 lecture, 3 lab hours)

H 186. Orchard Management (3)

Prerequisite: H 57, 112 or permission of instructor. Principles and practices of orchard management; appraisal; farm contracts and leases. (2 lecture, 3 lab hours)

H 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

ORNAMENTAL HORTICULTURE

OH 3. Fundamentals of Plant Propagation (3)

Principles of sexual and asexual propagation; seed identification, seedage, cuttage, specialized plant structures for propagation; propagation media, rooting aids, propagation structures. (2 lecture, 3 lab hours)

OH 22. Principles of Landscape Gardening (3)

Planting and maintenance of the garden; selection, planting, fertilization, irrigation, pruning of plant material; disease and insect control, weed control; lawn planting and care; the home vegetable and fruit garden, house and patio plants. (2 lecture, 3 lab hours)

OH 33. Plant Identification and Materials (3)

Identification, habits of growth, culture and landscape use of trees, shrubs, vines, annuals, herbaceous perennials including tropicals, subtropicals, conservatory and house plants. (2 lecture, 3 lab hours)

OH 53. Principles of Nursery Practice (3)

Prerequisite: OH 3. Nursery structures; practice in production of ornamental, fruit, nut, annual, perennial, bedding, vegetable, and pot plants; retail and wholesale nursery practices. (2 lecture, 3 lab hours)

OH 123. Production of Ornamentals (3)

Prerequisite: OH 53, Bot 1. Production of ornamental trees, shrubs, vines and groundcovers by cuttings, budding, grafting, layerage, separation and division; lining out, balling, bare rooting, canning, growing of cutting material, growing liners; pruning and training espaliers; specimen plant production. (2 lecture, 3 lab hours; one all-day field trip)

OH 125. Ornamental Trees (3)

Prerequisite: Bot 1, OH 3. Trees grown in California for landscaping, shade and ornamentation; identification, habits of growth, cultural requirements, landscape use. (2 lecture, 3 lab hours)

OH 132. Turfgrass Production and Management (3)

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)

OH 162. Nursery Management (3)

Prerequisite: OH 22, 33, 123. Design, construction and utilization of nursery structures; control of temperatures and lighting; business organization. (2 lecture, 3 lab hours)

OH 163. Farm and Home Landscaping (3)

Prerequisite: OH 22, 33, 123, 125. Arrangement, planning, planting the farmstead; arrangement and care of selected adapted ornamentals; layout, design and installation from plans. (2 lecture, 3 lab hours; 2 all-day field trips)

OH 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

VITICULTURE AND ENOLOGY

V 11. Grape Production (3)

Production of grapes; structure, physiology, and climatic requirements of the vine; fall budding, pruning, raisin drying; practice in fall cultural operations. (2 lecture, 3 lab hours)

V 13. Raisin Production and Processing (2)

Prerequisite: V 11 or permission of instructor. Principles and practices of raisin production and processing operations. The college vineyard and raisin processing laboratory will be utilized. (1 lecture, 3 lab hours)

V 15. Introduction to Enology (3) (Former E 15)

History and development of the wine industry; mechanics of various processes and factors involved in wine making.

V 16. Vineyard Operations (3)

Application of spring vineyard operations; laying out a vineyard, planting, trellising, training young vines, thinning, girdling; and grape propagation, cuttings, rootings, grafting (cleft, notch, bench, and green); T-budding and spring care of fall budded vines. (2 lecture, 3 lab hours)

V 50. Grape Varieties (3) Summer only

Prerequisite: V 11. Grape varieties common to California; rootstocks and species, identification, adaptability, and use.

V 101. Processing and Marketing Grapes (3)

Prerequisite: V 11, 50, Econ 1A. Processes in preparing grapes for market, marketing procedures; grape processing plants, and grape and raisin marketing centers. (2 lecture, 3 lab hours; 3-day field trip)

V 110. Grape Diseases and Pests (3)

Prerequisite: Ag 106, V 11. Grape diseases and pests; identification and control; application of sprays, insecticides; establishment of control programs. (2 lecture, 3 lab hours)

V 115. Winery Practices (5) (Former E 115)

Prerequisite: V 15, 50, Chem 109, Bact 54. Principles and practices of preparation of dessert and table wines; operation of plant equipment; controlled tests; sanitation and waste disposal problems. (3 lecture, 6 lab hours)

V 116. Advanced Winery Practices (4) (Former E 116)

Prerequisite: V 115. Winery operations; quality control and production of specialty products; laboratory tests for aldehydes and esters, copper and iron, pasteurization and fining; microbiological techniques. (2 lecture, 6 lab hours)

V 158A-B. Unit Operations I and II (3-3) (V 158A same as AgM 158) (Former E 158A-B)

Not open to students with credit in E 151A-B. Prerequisite: permission of instructor. Basic principles of industrial operations as they apply to the wine industry with application to chemistry and physics, transformation of energy, heat transfer, and flow of fluids; application of principles as they apply to evaporation, heat exchange equipment, distillation and drying.

V 160. Winery Technology (3) (Former E 160)

Prerequisite: permission of instructor. Technological study of winery equipment; evaluation, location, and operation; sanitation procedures. (2 lecture, 3 lab hours; 3- or 4-day field trip)

V 166. Vineyard Management (3)

Prerequisite: V 15, 101. Management of vineyards in the San Joaquin Valley; coordination of production and marketing, cost studies, and planning an economical vineyard. (2 lecture, 3 lab hours)

V 170. Viticulture Seminar (1; max total 2)

Open to seniors majoring in viticulture and enology. Latest developments in research; assigned research paper in viticulture or enology to be presented in both oral and written form.

V 171. Winery Management (3) (Former E 171)

Prerequisite: permission of instructor. Physical properties of a winery; administrative organizational set-up; personnel; purchasing, packaging, and shipping; local, state, and federal regulatory statutes.

V 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures–Independent Study*.

AIR SCIENCE DIVISION

Division Head..... Major Eugene C. Watkins

The Air Science Division through its instructional program provides precommissioning education and training which, in conjunction with the bachelor's degree, qualify a student for commissioning as an officer in the United States Air Force.

The program of military instruction includes a two-year basic course designed to provide education and training in military subjects common to the aerospace age; a two-year advanced course in global relations and leadership training leading to a reserve commission as a second lieutenant in the United States Air Force; and a minor for the bachelor's degree.

Field trips to Air Force Bases and familiarization flights in Air Force aircraft are normally offered to enrolled students.

A flight instruction program leading to a private pilot's license is offered to qualified seniors at government expense.

AIR SCIENCE DIVISION

Professor: Major Watkins (Head)
Assistant Professors: Major Cammack, Major Snover

MINOR

A minor in air science consists of 15 units including Air Sc 103A-B-C, 104A-B.

BASIC AIR SCIENCE

The basic course is designed to provide a fundamental understanding of aerospace power and includes leadership training. In addition, specified college courses in the areas of mathematics, physical science, natural science, foreign language, the humanities, or social science satisfy pre-commission officer education requirements and are designated as part of the air science curriculum. Consult the head of Air Science Division for the list of approved courses from which two courses must be selected.

The basic course is a prerequisite to enrollment in the advanced course. All male students who are physically qualified for military training and who are citizens of the United States are eligible to take the basic course. They are not, however, in the military service and assume no military obligation. Uniforms and military textbooks, as required, are provided by the government and must be returned in good condition upon completion of the course.

ADVANCED AIR SCIENCE

The advanced course, to which selected upper division students are admitted, upon successful completion leads to a reserve commission as second lieutenant in the United States Air Force. The students are not, however, in the military service and normally assume no military obligation while enrolled in advanced air science.

To be eligible for admission to the advanced course, a student must:

(1) Be a citizen of the United States and not less than 14 years of age.

(2) Be physically and morally qualified under standards of the Department of Air Force.

(3) Be accepted by the institution as a regularly enrolled student.

(4) Be not more than 26½ years of age, if programmed for flying training, or 28 years of age, if programmed for other than flying training, at date of graduation and commissioning.

(5) Successfully complete such survey and general screening tests as may be required.

(6) Be selected by the Professor of Air Science and the President of the College.

(7) Execute a written agreement with the United States Government and the President of the College to complete the advance course contingent upon completion of college at the institution at which he is enrolled or any other institution where such course is given in the case of a transfer from one institution to another.

(8) Devote five hours per week to the military education prescribed and pursue the courses of the Summer Training Unit during such period as prescribed by the Secretary of the Department of the Air Force, in consideration of commutation of subsistence to be paid to the student by the government.

(9) Have completed the basic course, or the equivalent thereof, for previous honorable active military service, as approved by the President of the College and the Professor of Air Science under regulations established by the Department of the Air Force.

An advanced cadet will receive a subsistence of approximately $27 a month which is paid quarterly. During attendance at the Summer Training Unit, normally held during the summer preceding the senior year, a student receives subsistence, quarters, and a monetary allowance of $78 for the month of attendance, plus

travel pay to and from the place of summer training. Reference books, officer-type uniforms and most textbooks are provided by the government. All AFROTC payments or other benefits are in addition to those to which a veteran is entitled under the GI Bill or other laws.

Courses

AIR SCIENCE

1A. Leadership Laboratory (1)

Introduction and orientation to ROTC and the Air Force; systematic instruction and education in leadership principles providing the cadet with guided learning experiences. Designated institutional courses in lieu of the academic air science phase (see division head for courses so designated).

1B. Foundations of Aerospace Power (2)

Constituent elements of aerospace power; basic aeronautical science; organization and operation of the military arm of the federal government. (2 lecture, 1 lab hour)

2A. World Military Systems (2)

Prerequisite: Air Sc 1A-B or equivalent. Comparative study of world military forces; free world land, naval, and air forces, communist military systems; trends in the development and employment of military power. (2 lecture, 1 lab hour)

2B. Leadership Laboratory (1)

Prerequisite: Air Sc 2A or equivalent. Systematic instruction and education in the application of leadership principles providing the cadet with guided learning experiences. Designated institutional courses in lieu of the academic air science phase (see division head for courses so designated).

103A-B. Growth and Development of Aerospace Power (3-3)

Prerequisite: Air Sc 2A-B or equivalent. Nature of war; development of United States airpower; mission and organization of Defense Department; Air Force concepts, doctrine, and employment; astronautics and space operations; future development of aerospace power; space programs, vehicles, systems, and problems in space exploration. (3 lecture, 2 lab hours)

103C. Air Force ROTC Summer Training Unit (3)

Prerequisite: Air Sc 103A-B or 104A-B. One month's training required for advanced cadets at designated Air Force installations to qualify for reserve commission. Physical training, drill, weapon familiarization, familiarization flying, field exercises, United States Air Force base activities, equipment, and problems.

104A. Global Relations (3)

Prerequisite: Air Sc 103A-B or equivalent. International relations; major factors underlying international tensions; nationalism, imperialism, and communism; attempts to alleviate these tensions; balance of power concepts; rise of the superpowers, United States and USSR. (4 lecture, 1 lab hour)

104B. Global Relations (3)

Prerequisite: Air Sc 104A or equivalent. Military aspects of world political geography, concepts, maps and charts, factors of power; geographic influences upon political problems with a geopolitical analysis of strategic areas. Briefing for commissioned service; the Air Force officer. (4 lecture, 1 lab hour)

APPLIED ARTS DIVISION

Division Head.....Horace O. Schorling

Department	*Chairman*
Home Economics	Louise W. Porch
Industrial Arts	Horace O. Schorling

The Applied Arts Division includes the departments of Home Economics and Industrial Arts. Majors and minors for the bachelor of arts degree, bachelor of vocational education degrees, bachelor of science degree in industrial technology, and the master of arts degree in industrial arts are offered. The division has well-developed programs which prepare for careers in teaching, business, industry, and government.

Home Economics..... 92
Industrial Arts..... 97

HOME ECONOMICS DEPARTMENT

(In the Applied Arts Division)

Professor: Porch (Chairman)
Associate Professor: Rose
Assistant Professors: Jarvis, Monts, Newsome, M. Rohrer, Rybicki, Sollie, Van Scoyoc
Part-time: Anders, Johnston, Sacks, Thoren, Wager, Yeary

The Home Economics Department offers a major and a minor in home economics for the bachelor of arts degree. Programs may be planned to provide preparation for professional careers in teaching, dietetics, nutrition, and institutional food service and for home economists in the agriculture extension service, social welfare, journalism, radio, television, and business. All curricula are planned to develop the knowledge, appreciation, and skills essential for successful living and family life.

HOME ECONOMICS MAJOR

The bachelor of arts degree major in home economics consists of the following 37 units:

	Units
H Ec 1, 10A, 10B, 11, 12A, 12B, 38, 39, 50	22
H Ec 110, 131, 132, 137, 139	15
	37

With departmental approval students may make adaptations in the core for specific career objectives as recommended below:

Home Economics Education. A major in home economics supplemented by other requirements for teaching credentials.

Home Economics and Dietetics. A major in home economics including such courses as quantity cookery, institutional management and dietetics and meeting the American Dietetics Association requirements in such fields as chemistry, bacteriology, and economics. A year of internship in an approved institution upon completion of the bachelor's degree is required for membership in the American Dietetics Association.

Home Economics in Agricultural Extension Service. A major in home economics with additional work in radio and television production.

Home Economics in Business. A home economics major of maximum breadth and depth supplemented by appropriate courses chosen from business, art, journalism, and speech.

Home Economics in Radio and Television. Home economics courses in all areas with selected courses in speech, radio and television.

Home Economics in Journalism. A broad major in home economics plus selected journalism courses in reporting, editing, feature writing, and public relations.

Home Economics in Social Welfare. A double major in home economics and social welfare with a psychology minor.

HOME ECONOMICS MINORS

Home economics minors may be varied with permission to meet individual needs and interests depending on students' majors.

General Minor	*Units*
H Ec 1, 11, 12A, 39, 40, 41, 43	14
H Ec 132, 133, 139	7
	21

Minor for Business Majors	*Units*
H Ec 38, 40, 43	4
H Ec 132, 6 units electives (incl 4 ud)	8
	12

CREDENTIAL PROGRAM

For information on the credential program consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

Courses

HOME ECONOMICS

1. Introduction to Home Economics (2)

The social and economic problems of the young American family; consumer decisions relating to clothing and textiles, food and nutrition, home furnishings, family finance; child development, family relationships; use of leisure time.

2. Home and Family Life (3)

Modern homemaking in theory and practice; house plans, furnishings and equipment, furniture refinishing; meal planning, preparation and service; selection of china, glass and silver. Activities in practice apartment. (2 lecture, 4 lab hours)

10A-B. Food Study (3-3)

Prerequisite: Chem 2A-B or permission of instructor. Preparation and service of foods for family meals; psychological, cultural, aesthetic, economic, nutritional, and scientific principles. (2 lecture, 4 lab hours)

11. Textiles (3)

Principles of fabric production; characteristic use and care of natural and man-made fibers, use and care of new finishes; laboratory testing to determine the ability of the fabrics to withstand normal wearing conditions. (2 lecture, 2 lab hours)

12A. Clothing Construction (2)

Clothing selection and construction with emphasis on the individual; basic theories influencing skills and techniques; use of commercial patterns. (1 lecture, 3 lab hours)

12B. Clothing Construction (3)

Continuation of H Ec 12A. Advanced problems in construction; use of modern fabrics; development of originality in design. (1 lecture, 5 lab hours)

31. Dietetics (2)

Elements of nutrition and diet in disease; principles involved in feeding the sick. (1 lecture, 3 lab hours)

38. Problems in Home Furnishing (1)

Basic principles in selecting and furnishing a satisfying home; design and functional consideration in selection of floor coverings, wall finishes, draperies, lighting, furniture, and accessories.

39. The Child in the Family (2)

Open to non-majors. Prenatal care of mother and child; development and guidance of children from birth to twelve years in relation to the family group. Supervised observation of children in nursery schools, hospitals, child guidance clinics.

40. Elementary Nutrition (2)

Not open to home economics majors. Nutrition for promotion of good family health; relation of inadequate dietaries to nutritional deficiencies; minimum food budgets in relation to optimum nutrition.

41. Food for the Family (2)

Not open to home economics majors. Menu planning, meal preparation, nutritional needs of the family; service, cost, management, and social aspects of family meals. Lecture, discussion, with laboratory periods for preparation and serving of breakfast, luncheon, dinner, and special meals.

42. Management for Effective Living (2)

Offered for men students. Foods and nutrition; care and selection of clothing; human relationships; child care and development; family finance and consumer problems.

43. Social Procedure (1)

Present day social procedure; introductions and social correspondence; table service and etiquette; selection of china, glassware, silver.

50. Household Equipment (3)

Selection, methods of operation, and care of household appliances; testing electrical equipment for efficiency and cost of operation; kitchen planning, arrangement of work, preparation and serving units. (2 lecture, 2 lecture-lab hours)

100. Advanced Clothing (3)

Prerequisite: H Ec 12A-B. Tailoring a suit or coat; draping, using individual dress form.

101. Economics of Clothing Consumption (2)

Psychology of clothing selection, causes of fashion trends; designers; commercial production of ready-to-wear; merchandising, protective legislation for consumer. Special reports on buying consumer goods.

110. Home Management (5)

Application of theory of home management to creative and intelligent home living; establishment of values, goals and standards of living; relationship of money, material goods, time and energy to management process; care and use of household equipment and furnishing; family health, home safety, home nursing. (4 lecture, 6 lab hours)

130. Experimental Food Study (2)

Prerequisite: H Ec 10A-B. Principles of food processing; structure and composition of basic raw foods, their behavior during processing; food demonstration techniques; experimental cookery. (2 lecture, 2 lab hours)

131. Marriage and the Family (2)

May be used to fulfill 2 units of the general education requirement in social science. Appreciation of and an intelligent approach to the problems and responsibilities of marriage and family life; functions, status and problems of the present-day American family; factors basic to success; legal aspects of marriage; psychology and physiology of sex.

132. Family Finance (2)

Practical financial problems of the individual and family; bank accounts, consumer credit, insurance, savings, and investments; wills, property laws, home mortgages; personal and family budgets; efficient buying practices.

133. Home Furnishings (2)

Recommended H Ec 38. History of homes and home furnishings from the time of early Egyptians to the present; geographic, sociological, economic, cultural, religious and other influences affecting design; furnishings from various periods in the present day home.

137. Nutrition (3)

Prerequisite or concurrently: general chemistry. Principles of nutrition and factors influencing ability of the individual and the family to secure and maintain good nutritional status; requirements at different stages of growth and development; recent scientific developments in the field.

138. Diet in Disease (2)

Prerequisite: H Ec 137 or permission of instructor. Metabolism in disease and adaptation of diet to meet existing conditions. (2 2-hour lecture-labs)

139. Child Development (3)

Prerequisite: H Ec 39 or permission of instructor. Application of principles of development and guidance in specific situations in the child development laboratory. Directed observation and participation in guiding children in the nursery school; opportunities to work with parents. (2 lecture, 3 lab hours)

140. Methods of Teaching Home Economics (3)

Philosophy and procedures of homemaking education in secondary schools; factors in homemaking teaching competence; observation in public schools. (2 lecture, 2 lab hours)

141. Institution Organization and Management (3)

Institution food service organization and operation; management principles; methods of control, selection, and training of personnel; food cost control and record keeping.

142. Quantity Cookery (3)

Prerequisite: H Ec 10A-B, 130, junior standing. Calculation of raw materials needed; experience in quantity food preparation and service; use and care of institution food service equipment. (2 lecture, 4 lab hours)

143. Institution Experience (3)

Open only to dietetics majors. Prerequisite: H Ec 138, 141, 142. Supervised work experience in hospital dietary departments. (Lecture-lab hours arranged)

144. Marketing, Equipment and Plant Layout (3)

Wholesale market functions and purchase of food for institutional use, factors determining quality and cost; floor plan and layouts; materials, construction, specifications, and maintenance of equipment, furniture, and furnishings for institution food units.

180. Advanced Studies in Home Economics (2)

Advanced study of problems related to the teaching of home economics. (Recommended for student teachers)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study.*

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

280. Seminar in Food and Nutrition (3; max total 6 if no area repeated)

Prerequisite: biochemistry, permission of instructor. Review of biology and microbiology in nutrition research; critical interpretation of recent developments in nutrition.

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.

INDUSTRIAL ARTS DEPARTMENT

(In the Applied Arts Division)

Professors: Schorling (Chairman), Bliss, Dunning, Noakes
Associate Professors: Dettinger, Feuches, McComas, F. E. Schroeter
Assistant Professors: L. Aldrich, Blomgren, Gonser, Newcomb, Rockwell

The Industrial Arts Department offers a major and minor in industrial arts for the bachelor of arts degree, a major in industrial technology for the bachelor of science degree, and a major in industrial arts for the master of arts degree. The department also offers a major for the bachelor of vocational education degree. Individual programs are planned to provide for professional careers in teaching and in business and industry. The industrial technology major emphasizes physical science and industrial management as well as the subject fields within the industrial arts for students seeking technical and managerial positions in industry.

BACHELOR OF ARTS DEGREE IN INDUSTRIAL ARTS

The bachelor of arts degree in industrial arts consists of 124 units. The general requirements for the bachelor of arts degree must be completed (see *Degrees and Credentials*). Students majoring in industrial arts must complete a minimum of 40 units of industrial arts courses, 16 of which must be upper division, excluding IA 192, 194, 196. Students may elect to do the major part of their work in various areas such as drafting, metal, graphic arts, woodwork, crafts, electricity-electronics, or automotive and transportation.

Industrial Arts Major

	Units
IA 12, 41, 52, 60, 70, 80	18
IA electives (incl at least 16 u.d.)	22
	40

Industrial Arts Minor

Elect from IA 12, 41, 52, 60, 70, 80	9
IA electives (incl at least 6 u.d.)	11
	20

BACHELOR OF SCIENCE DEGREE IN INDUSTRIAL TECHNOLOGY

The bachelor of science degree with a major in industrial technology consists of 128 units, including one of the options listed below. The general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*). In addition to the specific requirements in one of the options, all industrial technology majors must complete the following courses: Econ 1A-B, Physics 2A-B.

Industrial Technology Major

Automotive Industries Option	*Units*
IA 12, 41, 52, 71, 73, 74, 113, 114, 124, 129, 156, 171, 174, 175 or 176	40
Engr 11; Bus Ad 8, 151, 153	11
Electives in related areas approved by department	30
	81

Drafting Option	
IA 41, 42, 52, 70, 71 or 171, 74, 82, 140, 143, 146, 148, 158, 173, 174	39
Engr 1, 1L, 11, 26; Math 3; Art 7, 9, 11	19
Electives in related areas approved by department	23
	81

Electrical Industries Option *Units*

IA 41, 52, 71, 73, 74, 140, 146, 152, 153, 154, 156, 158, 170 or 173, 174, 175 or 176 43
Engr 11; Math 3; Bus Ad 8, 151, 153 16
Electives in related areas approved by department 22
81

Graphic Arts Industries Option

IA 52, 60, 74, 146, 160, 162, 164, 166 21
Bus Ad 8, 151, 153; Acct 1A-B, 132; Mkt 140, 141, 150; Art 3, 7, 9, 115 35
Electives in related areas approved by department 25
81

Metal Industries Option

IA 41, 52, 70, 71, 73, 74, 140, 146, 156, 170, 171, 173, 174, 175, 176, 178 44
Engr 11; Math 3; Bus Ad 8, 110 13
Electives in related areas approved by department 24
81

Wood Industries Option

IA 41, 42, 52, 73, 80, 82, 143, 146, 148, 158, 173, 181, 182, 186, 190 43
AgM 91; Acct 1A; Bus Ad 21, 151, 153; Art 3, 7, 9; Mkt 150 22
Electives in related areas approved by department 16
81

BACHELOR OF VOCATIONAL EDUCATION DEGREE

This degree is limited to candidates recommended by the State Board of Examiners for Vocational Teachers. The applicant will have received, through this Board of Examiners, credit for occupational, managerial, and supervisory experience of from 20 to 40 units to be applied toward the major. Credits earned in Trade and Industrial Teacher Training will be applied toward a minor.

Each applicant for the degree shall have completed a course of 124 units with a grade-point average of 2.0 or better (on a four grade-point system), including credits allowed by the Board of Examiners.

Units

General Education 45
Major in Vocational Education (24 lower division; 12 upper division) 36
(Board of Examiners evaluation plus upper division courses to total 36 units.)
Minor in Vocational Teacher Training 18
Electives (general or professional) 25
124

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in industrial arts is based on the equivalent of the undergraduate major at Fresno State College. Twenty of the 30 units required for the degree must be in industrial arts. For specific requirements, consult the chairman of the department; for general requirements, see *Degrees and Credentials—Master's Degrees* and *Graduate Bulletin.*

Courses

INDUSTRIAL ARTS

Note: Industrial arts courses have been renumbered and regrouped under the following areas: automotive, crafts, drafting-design, electricity-electronics, graphic arts, metals, woodworking, professional, and graduate.

AUTOMOTIVE AREA

IA 12. Basic Automotive Systems (3) (Former IA 9)
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. (lecture-lab)

IA 113. Advanced Automotive Systems (3) (Former IA 109A)
Prerequisite: IA 12, 52. Advanced study of automotive engines, electrical systems, automatic transmissions, brakes, and power transmitting mechanisms; sciences involved with internal combustion, electricity, hydraulics, pneumatics, energy conversion. (lecture-lab; field trips)

IA 114. Automotive Technical Problems (3) (Former IA 116)
Prerequisite: IA 12. Automotive air conditioning, body applications, diesel, fuels and lubricants technology, small horsepower engines and laboratory organization. (lecture-lab; field trips)

IA 124. Automotive Diagnosis and Correction (3) (Former IA 109B)
Prerequisite: IA 12. Automotive testing, servicing and repair processes applied to engine, power transmission, and chassis components. (lecture-lab; technical reports)

IA 129. Automotive Systems Repair Procedures (3) (Former IA 110)
Prerequisite: IA 12. Technology of engine rebuilding, carburetor and electrical service, power transmission, brakes and wheel suspension, body work and tune-up. (lecture-lab; technical reports)

CRAFTS AREA

IA 34. Theatre Craft (3) (See Drama 34)

IA 130. Handwork in Elementary Education (3)
Limited to elementary credential candidates. Introduction to handwork for elementary schools; handwork units correlated with various subjects in elementary curriculum; development and fabrication of teaching aids.

IA 133. Industrial Crafts (2; max total 4) (Former IA 108A-B)
Creative and recreational experiences in craft media including plastics, leather, wood, metal, enamels; historical, cultural, technological information. (lecture-lab)

IA 134. Advanced Theatre Craft (3) (See Drama 134)

DRAFTING-DESIGN AREA

IA 41. Applied Drawing (3) (Former IA 19)

Grammar and composition of drawing, sketching, lettering, orthographic projection, working drawings, auxiliary views, dimensioning, developments, pictorial drawing, and duplication.

IA 42. Architectural Drawing (3) (Former IA 22)

Architectural drafting techniques and standards; progress from fundamentals to completing light construction working drawings, floor plans, elevations, details; application of city and county codes.

IA 140. Machine Drawing (3) (Former IA 121)

Prerequisite: IA 41 or permission of instructor. Detail working drawings of machine parts, precision dimensions, limits and tolerances, threads, shop notes, parts lists, fasteners, assembly drawings, exploded views.

IA 143. Architectural Drawing (3) (Former IA 122)

Prerequisite: IA 41 or permission of instructor. Mechanical perspective, its theory and practical application to architectural and industrial problems.

IA 146. Materials of Product Design (2) (Former IA 150)

Prerequisite: IA 41 or permission of instructor. Selection and use of materials in industrial arts design; organization and experimentation in two- and three-dimensional problems using varied media in industrial arts projects.

IA 148. Product Design (2) (Former IA 151)

Prerequisite: IA 41 or permission of instructor. New scientific developments related to design problems and industrial products; relationship of two- and three-dimensional expression in space, form and function techniques, skills of the craftsman.

ELECTRICITY-ELECTRONICS AREA

IA 52. Basic Electricity (3) (Former IA 11)

Introduction to electricity including fundamentals of electrostatics, alternating and direct current electrical circuits, electrical calculations, magnetics, circuit applications, electrical measuring and test equipment. (lecture-lab)

IA 152. Fundamentals of Electronics (3) (Former IA 111B)

Prerequisite: IA 52. Basic electronic components and circuits including inductors, capacitors, alternating current circuits; resonance and filters; vacuum tubes and transistors; power supplies; measuring devices; oscillators; amplifiers. (lecture-lab)

IA 153. Advanced Electronics (3) (Former IA 111C)

Prerequisite: IA 152. Electronic systems and applications including basic transmitters, amplitude and frequency modulation transmitters and receivers; transistor applications; antennas; television. (lecture-lab; field trips)

IA 154. Industrial Electronics (3)

Prerequisite: IA 153. Industrial electronics systems analysis; applications of electronic circuits and devices to industrial process and machine control. (lecture-lab; field trips)

IA 156. Principles of Electrical Rotating Machines (3) (Former IA 111A)

Prerequisite: IA 52. Principles of construction, operation, maintenance, and repair of alternating current and direct current motors and generators. (lecture-lab; field trips)

IA 158. Principles of Electrical Wiring (3) (Former IA 111D)

Prerequisite: IA 52. Principles of electrical power distribution; industrial and residential wiring; circuits, devices, and systems; local and national electrical codes. (lecture-lab; field trips)

GRAPHIC ARTS AREA

IA 60. Basic Graphic Arts (3) (Former IA 26)

Introduction to the graphic arts; hand composition, paper making, stereotype, rubber-stamp, thermography, marbling; experiences in relief printing methods; overview of entire printing industry. (lecture-demonstration; student projects, field trips)

IA 160. Advanced Graphic Arts (3) (Former IA 127)

Prerequisite: IA 60 or permission of instructor. Typographic layout and design; problems of book manufacture; principles of advertising layouts; hand, machine, and photographic typesetting methods; experience in running automatic printing press and typesetting machine. Field trips.

IA 162. Graphic Arts Crafts (2) (Former IA 128)

Various processes and media used in the graphic arts industry; creative and recreational aspect for the student; silk screen, linoleum block, flexography, intaglio, stereotype, papermaking, thermography, marbling, student projects. Field trips.

IA 164. Bookbinding (2) (Former IA 142)

Historical development of the book and its influence on our society; preparation for publication, methods of reproduction and materials used; projects in binding and rebinding; yearbook and textbook problems. Field trips.

IA 166. Publications Production Management (3) (Former IA 145)

Prerequisite: upper division student. For persons interested in the field of buying, selling or producing printed material. Processes of reproduction; types of publications; media, materials and equipment; technical problems in layout; legal problems; yearbook and in-plant publication reproduction. Field trips.

METALS AREA

General Metalworking

IA 70. Basic Metalworking (3) (Former IA 40)

Introduction to and exploration in various metal areas including sheet metal, bench metal, art metal, wrought iron foundry and forging.

IA 170. Advanced Principles of Metalworking (3) (Former IA 119)

Prerequisite: IA 70 or equivalent. Study and experience in nonferrous metal casting, core-making, forging; principles of metal spinning.

Welding

IA 71. Basic Welding (2) (Former IA 6)

Fundamentals of oxyacetylene and shielded metallic arc welding processes; oxyacetylene flame in brazing and flame cutting; familiarization with commonly welded joints; types, uses, and classification of electrodes and equipment. (lecture-lab)

IA 171. Advanced Welding (2) (Former IA 106)

Prerequisite: IA 71. Major welding processes and fields of application; weldability of ferrous and nonferrous metals and alloys; fundamentals of welding metallurgy; welding symbols; introduction to destructive and nondestructive testing methods. (lecture-lab)

Sheet Metalworking

IA 73. Basic Sheet Metalworking (3) (Former IA 18)

Sheet metal pattern drafting and layout applicable to parallel and radial development; bending, forming, and assembling of industrial items relative to light gauge metals.

IA 173. Advanced Sheet Metalworking (3) (Former IA 118)

Prerequisite: IA 73 or equivalent. Sheet metal pattern drafting and layout applicable to triangulation using light gauge metals; individual problems in planning, using, and maintaining hand and machine tools.

Machine Tool Metalworking

IA 74. Basic Machine Tool Metalworking (3) (Former IA 10A-B)

Basic methods of machining metals, including drilling, turning and boring, milling, grinding, and shaping; measuring tools, precision measuring instruments, and layout; steel and its heat treatment. (lecture-lab)

IA 174. Advanced Machine Tool Metalworking (3) (Former IA 112)

Prerequisite: IA 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. (lecture-lab)

IA 175. Machine Tool Technical Problems (3) (Former IA 115)

Prerequisite: IA 74. Technical problems in design, layout, fabrication, machineability of materials, tooling, gearing principles, speeds and feeds, coolants related to modern manufacturing processes; installation, preventive maintenance, adjustment, repair of machine tools; specifications of materials and equipment. (lecture-lab)

IA 176. Advanced Machine Tool Problems (3)

Prerequisite: IA 174. Advanced technical work in metals area; introduction to tool and die work; jig and fixture principles and practices; heat treatment; experimental work and technical reports.

Metal Craft

IA 177. Metal Craft (2) (Former IA 117A)

Technological, scientific, historical, cultural, and economic aspects of the nonferrous metals and the industries to which they relate; individually designed and hand crafted articles produced through coordinated laboratory experiences. (lecture-lab)

IA 178. Advanced Metal Craft (2) (Former IA 117B)

Study of nonferrous metal industries; emphasis on spinning and precision casting; design and execution of projects through coordinated laboratory experiences. (lecture-lab)

IA 179. Jewelry (2) (Former IA 107)

Designing and executing articles of jewelry using a wide range of traditional and contemporary materials and techniques; historical, cultural, economic, scientific and technological aspects of jewelry coordinated with laboratory experiences. (lecture-lab)

WOODWORKING AREA

IA 80. Basic Woodworking (3) (Former IA 1)

Basic woodworking processes and materials; use and care of hand tools and portable electric tools; design, construction, and finishing of simple wood products; faceplate and spindle turning; basic operations on light woodworking machinery; basic information units in wood technology.

IA 82. Wood Machining (3) (Former IA 2)
Prerequisite: IA 80 or permission of instructor. 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.

IA 181. Wood Frame Building Construction (3) (Former IA 100)
Principles of wood frame construction including foundations, framing, exterior finish and related areas of layout, estimating and ordering materials; tract building and prefabrication principles.

IA 182. Advanced Wood Machining (3) (Former IA 101)
Prerequisite: IA 82. Construction of furniture, cabinet work and millwork; design, construction details, production methods.

IA 184. Woodworking Specialties (3) (Former IA 103)
Prerequisite: IA 82. Specialized activities related to field of woodworking; wood finishing and paint technology, machine installation and maintenance, upholstering, inlaying and veneering, advanced wood turning, furniture restoration, hand tool skill perfection.

IA 186. Wood Technology (3) (Former IA 104)
Prerequisite: IA 82 or permission of instructor. Properties and uses of wood, lumber grading, lumber and wood products manufacturing, wood seasoning and preserving, plywood and laminated wood, glue and glued products, fiber and particle boards, wood bending. (lecture-lab)

PROFESSIONAL COURSES

IA 190. Independent Study (1-3; max see reference)
See *Regulations and Procedures–Independent Study*.

IA 192. Industrial Arts Education in Secondary Schools (3) (Former IA 123)
Prerequisite: A Ed 105. Principles, objectives, and recent trends in modern industrial arts instructional practices, including group observation.

IA 194. Course Materials in Industrial Arts Education (2) (Former IA 125)
Prerequisite: IA 192. Development and use of written instructional materials; analysis and organization of course content for various subjects in industrial arts areas.

IA 196. Instructional Aids in Industrial Arts Education (2) (Former IA 126)
Preparation and use of instructional aids, including models, mockups, cutaways, charts, educational films, slides, overlays; planning, construction, classroom demonstration and evaluation.

GRADUATE COURSES

(See *Course Numbering System–Definitions and Eligibility*)

IA 224. Industrial Education Philosophy and History (2)
Evolution, development, and present status of industrial education; industrial arts education and trade and industrial education; industrial arts in general education; developing, promoting, and improving a program of instruction in industrial arts.

IA 270. Graduate Technical Problems in Industrial Arts (2-9; max total 9 if no area repeated)
Technical work in selected areas; research under supervision of instructor.

IA 280. Problems in Industrial Arts Research (2)
Seminar in research procedures in the industrial arts; basic bibliography, research form and method.

IA 284. Seminar in Industrial Arts (2-6; max total 6 on master's degree if no area repeated)

Advanced study in different phases of industrial arts; recent developments and trends in the various design, drawing, and technical areas of industrial arts.

IA 285. Planning Industrial Arts Facilities (2)

Planning and organizing various types of school shops; architectural considerations, selection and specifications of equipment. Field trips.

IA 286. Safety and Related Problems (2)

Research and study of safety problems in industrial education; planning and evaluation of specific safety programs.

IA 287. Planning and Organizing Industrial Arts Curriculum (2)

Modern industrial arts curriculum; organization and management; recent trends concerned with equipment, supplies, content, safety, and methods.

IA 288. Administration and Supervision of Industrial Arts (2)

Policies and procedures in administration and supervision of industrial arts.

IA 290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

IA 299. Thesis or Project (2-4; max total 4)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

BUSINESS DIVISION

Division Head ..... McKee Fisk

Division Administrative Assistant ..... William C. Wayne

Bureau of Business Research and Service Director ..... Roger W. Allen

Institute of Industrial Relations Director ..... Grady L. Mullennix

The Business Division prepares students for professional careers in the business world and for teaching in secondary schools. The program is designed to provide a knowledge of the principles, procedures and art of business management; an understanding of the role and responsibility of business in present day society; a foundation of basic background materials for participation in the American enterprise system; and such proficiency in technical skills and information as the job market demands.

The division offers bachelor of science degree programs in the four specialized business areas of accounting, business administration, marketing, and office administration, and in agribusiness. A minor and special courses are offered to supplement work in other fields.

Three master's degrees are offered: the master of business administration, master of science, and master of arts. The master of business administration degree is designed to prepare students for careers in management of business enterprises and other organizations, including public corporations, educational systems, and nonprofit institutions. The master of science degree provides specialized advanced work in business as distinguished from the broader program of management. The master of arts degree is designed to deepen the competence of teachers of business subjects in secondary schools.

A Bureau of Business Research and Service and an Institute of Industrial Relations are part of the division program.

The Business Division is a member of the American Association of Collegiate Schools of Business.

Business 106

Accounting
Agribusiness
Business Administration
Business Education
Marketing-Retailing-
Advertising
Office Administration

8—17599

BUSINESS DIVISION

Professors: Fisk (Head), Austin, Jepsen, Mudge, Mullennix, A. Pierson, H. Rohrer, Tidyman
Associate Professors: Brooks, R. Carr, Halper, Hampton, W. Parker, Wayne, Wight
Assistant Professors: R. W. Allen, Ang, Bedrosian, Bohman, I. Davis, Emerson, Haggblade, Hashmi, Kronbach, R. Piersol, Reighard, Titus
Lecturer: M. J. Alexander
Part-time: Bozarth, Enmark, V. Graves, Livingston, McDermott, Peart, F. Taylor

Opportunity is afforded students through classes and student organizations to become acquainted with business and industrial organizations in California and the San Joaquin Valley. Effort is made to adapt the program to meet the particular needs of the San Joaquin Valley. Business and industrial concerns in Fresno and vicinity cooperate to make possible practical application of the theory studied in the classroom through field trips and guest lecturers in classes. A special course, business lectures, brings to the campus each week a business executive who discusses some topic of current business and economic interest. The Beta Gamma Sigma Colloquium brings to the campus well-known top management men for discussions with selected senior and graduate students. The division sponsors professional organizations for both men and women. A convocation of all business students is held once each semester, bringing to the campus a well-known leader to discuss some scholarly aspect of business. This blending of the practical and theoretical is designed to insure vitality of instruction and breadth of vision.

BUREAU OF BUSINESS RESEARCH AND SERVICE

The Bureau of Business Research and Service is organized within the Business Division to meet the research and service needs of the students and faculty of the Business Division and of the San Joaquin Valley business community. The Bureau compiles, interprets, and publishes statistics and studies on the local and regional economy, including *Fresno Facts and Trends*, which is published monthly during the regular academic year in cooperation with the Fresno County and City Chamber of Commerce. It facilitates research in appropriate areas by the students and faculty; seeks cooperative arrangements with outside organizations for conducting specific research and service projects; and arranges and conducts executive development and other programs as the need arises.

INSTITUTE OF INDUSTRIAL RELATIONS

In cooperation with labor and management groups in the San Joaquin Valley, the Institute of Industrial Relations offers work both on campus and off campus. It also provides opportunities for students to participate in labor relations programs and to engage in research in the field.

HIGH SCHOOL PREPARATION

In addition to the usual college preparatory courses it is recommended that students include four years of English, mathematics through intermediate algebra, and one year each of typewriting and bookkeeping in their high school programs.

BACHELOR OF SCIENCE DEGREE MAJORS

Majors are offered in the following fields for the bachelor of science degree. See general degree requirements under *Degrees and Credentials.*

The *accounting* major prepares for the California examination for Certified Public Accountant and for positions in governmental, public, internal, and general accounting.

The *agribusiness* major prepares students for positions in businesses allied with agriculture. These include farm credit and finance, agricultural purchasing, processing, and marketing, as well as management and office positions in agricultural industry. The degree requires 128 units including course work in both business and agriculture.

The *business administration* major prepares for positions in the fields of banking and finance, business and industrial management, small business operation, and personnel administration.

The *marketing* major prepares for positions in retailing and merchandising; in advertising; and in other types of general and specialized marketing work such as specialty selling, sales management, agricultural marketing, and market research.

The *office administration* major prepares students for responsible positions as personal and executive secretaries, administrative assistants, and office supervisors.

MAJOR REQUIREMENTS

Each student desiring to major in a business field must select one of the majors listed below. Except for office administration (which requires 41 units), a minimum of 45 upper division units is required for bachelor of science degree majors. The general regulations and general education requirements for a bachelor's degree must be completed (see *Degrees and Credentials*).

Additional Requirements: Econ 1A-B and Bus Ad 22 or Math B or equivalent are required of all majors in the division; Math 2 is required for accounting majors; IA 60 is required for marketing (advertising) majors. Recommended additional courses are: Geog 3, Econ 110, Soc 1A, Psych 145. Demonstrated ability in the use of the typewriter as indicated by a proficiency examination or by credit in a college typing course is also required of all majors in the division.

MAJORS FOR BACHELOR OF SCIENCE DEGREES

(See *Additional Requirements* above)

Accounting — *Units*

Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100	27
Acct 120A-B, 132, 144, 162, electives (3 un)	18
Elect 3 units from each of two of the following series	6
(a) Bus Ad 100, Econ 100A	
(b) Bus Ad 104, Econ 103	
(c) Bus Ad 134, 135, Econ 131A	
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Agribusiness (Business Option)

Business Courses

Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100	27
Bus Ad 100, Mkt 102	6
Elect from: Acct 128, 132, Bus Ad 104, 120, 124, 143, 180, 183, 184, Mkt 106, 108, 140, 150, 176	6

Agriculture Courses

Elect from: CP 11, H 11, OH 3, V 11, 15	6
Elect from: AH 1, 71, DS 11A, 11B, PH 1, 32	6
Elect from: AgM 15, 17, 115A, 115B, 151A, 159	6
Elect from: Ag 106, 112, 130, 136, 159, AH 116, 172, 175	12
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Business Administration *Units*

Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100 27
Bus Ad 100, 120, 124 9
Elect from: Acct 120A, 128, 132 3
Elect 6 units from each of two of the following series or 12 ud Econ: 12

(a) Bus Ad 135, 139
(b) Bus Ad 132, 134, Econ 131A
(c) Bus Ad 143, 144
(d) Bus Ad 153, 154, Econ 150
(e) Bus Ad 152, 156, Psych 181
(f) Bus Ad 180, 181, 183, 184
(g) Bus Ad 119, Econ 174
(h) Bus Ad 104, Econ 103, Mkt 108
(i) Mkt 176, Econ 178
(j) Bus Ad 160, 161
(k) Bus Ad 129, Jour 113
(l) Econ (6 or 12 ud units)

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Marketing

Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 10 or 100 27
Mkt 106, 140, 150 9
Elect one subject field: 13–17

(a) *General Marketing*
Bus Ad 100, 137, Mkt 105, 108, 155
Elect one: Econ 170, Mkt 176

(b) *Advertising*
Mkt 108, 141, 144, Jour 145A-B; and Art 101 or Jour 17A
Elect 3 units from: Jour 106, 113, Mkt 105, 199

(c) *Retailing*
Mkt 130, 132, 134, 199 (2 un), Jour 145A
Elect one: Mkt 105, Bus Ad 137, 143, Jour 145B

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Office Administration

Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100 27
Bus Ad 160, Off Ad 4, 103, 105, 107 13
Elect from one of the following series: 9
(a) Off Ad 112, 114, 121
(b) Acct 120A or 128 or 132; 6 units from Bus Ad 137, 143, 153, 161

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SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE MAJORS

In addition to the specific courses listed below, general education requirements and electives should be included to bring total to 15-16 units per semester. Math B or Bus Ad 22 is required of students without credit in two years of high school algebra. A total of 124 units must be completed for the bachelor of science degree (128 for degree in agribusiness). (See also *Degrees and Credentials.*)

Accounting
1st Year: Off Ad 1 or 2 (or exam), Math 2
2nd Year: Acct 1A-B, Econ 1A-B
3rd Year: Acct 120A-B, 132, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100
4th Year: Acct 144, 162, Acct electives (3 un); approved Bus Ad and Econ electives

Agribusiness
1st Year: Off Ad 1 or 2 (or exam), approved agriculture electives (6 un)
2nd Year: Acct 1A-B, Econ 1A-B, approved agriculture electives (6 un)
3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100, approved agriculture electives (6 un)
4th Year: Bus Ad 100, Mkt 102, approved business electives (6 un), approved agriculture electives (12 un)

Business Administration
1st Year: Off Ad 1 or 2 (or exam)
2nd Year: Acct 1A-B, Econ 1A-B
3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100, Acct elective (3 un)
4th Year: Bus Ad 100, 120, 124, approved electives (12 un)

General Marketing
1st Year: Off Ad 1 or 2 (or exam), Mkt 10
2nd Year: Acct 1A-B, Econ 1A-B
3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 105, 140, 150
4th Year: Bus Ad 100, 137, Mkt 106, 108, 155, Econ 170 or Mkt 176

Marketing-Advertising
1st Year: Off Ad 1 or 2 (or exam), Mkt 10, IA 26
2nd Year: Acct 1A-B, Econ 1A-B
3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 140, 150, Jour 145 A-B
4th Year: Mkt 106, 108, 141, 144; Art 101 or Jour 17A; field elective (3 un)

Marketing-Retailing
1st Year: Off Ad 1 or 2 (or exam), Mkt 10
2nd Year: Acct 1A-B, Econ 1A-B
3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 140, Jour 145A
4th Year: Mkt 106, 130, 132, 134, 150, 199, field elective (2-3 un)

Office Administration
1st Year: Off Ad 1 or 2 (or exam), 4
2nd Year: Acct 1A-B, Econ 1A-B
3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100, Off Ad 103, 105, approved electives (3 un)
4th Year: Bus Ad 160, Off Ad 107, approved electives (6 un)

BUSINESS MINOR

The following business minor is offered for students with majors in other departments. Satisfactory skill in the use of the typewriter as demonstrated by a proficiency examination or credit in Off Ad 1 or 2 or equivalent is required of all minors.

	Units
Acct 1A	3
Elect from: Bus Ad 102, 110, 118A, 133, 151, Mkt 100	6
Elect from not more than two fields (8 ud): Acct, Bus Ad, Mkt, Off Ad	11
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CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in business is designed primarily for students interested in teaching business subjects in secondary schools. Students interested in junior college teaching should take the master of business administration degree. The master of arts degree program is based upon an acceptable undergraduate degree in business. Twenty of the 30 units required for the degree must be in business and economics, including Bus 200, 282, and 299.

The Admission Test for Graduate Study in Business should be taken preferably prior to application for admission to the graduate program, or as soon as possible after admission and before advancement to candidacy for the degree. A qualifying examination must be passed before admission to candidacy covering the fields of accounting, business education, business law, business organization, marketing, personnel administration, and statistics. This examination should also be taken before admission to the program or as soon as possible thereafter.

For specific requirements consult the head of the division; for general requirements, see *Degrees and Credentials—Master's Degrees.*

MASTER OF SCIENCE DEGREE

The master of science degree is available for students in specialized programs in business. For details, consult the divisional graduate adviser.

MASTER OF BUSINESS ADMINISTRATION DEGREE

The degree of master of business administration is designed to prepare students for careers in management of business enterprises and other organizations, including public corporations, educational systems, and nonprofit institutions; and in college teaching. It is awarded upon satisfactory completion of a two-year program of study or its equivalent, normally 54 units. The first year is designed for students holding the bachelor's degree in some field other than business. Students with a bachelor's degree in business or equivalent preparation may enter directly into the second-year program. Students whose undergraduate work includes courses normally required in the first-year graduate program may have their total program reduced. If courses in economics were not included in the undergraduate work, students will be required to take at least 3 units in economics in the graduate program.

The Admission Test for Graduate Study in Business should be taken preferably prior to application for admission to the graduate program, or as soon as possible after admission and before advancement to candidacy for the degree. A qualifying examination must be passed before admission to candidacy covering the fields of accounting, business law, business organization, finance, marketing, personnel administration, and statistics. This examination must be passed after the first-year program requirements have been met.

First Year

	Units
Specified course in each: accounting, business, finance, business law, business management, business statistics, economics, marketing, personnel management	24
Approved electives	0–6
	24–30

Second Year

Bus 200, 220, 223, 291	13
Elect in one field of concentration: Acct, Bus Ad, or Mkt (incl a 200 course)	6
Elect one (not previously completed): Acct 120A, 128, 132	0–3
Approved electives in business, economics, engineering, or related fields	4–11
(Include 20 units in 200 series)	24–30

Additional Requirements: Other courses may be specified after examination of the student's record and his performance on the divisional qualifying examination, which should be taken as early as possible.

Courses

ACCOUNTING

1A-B. Principles of Accounting (3-3)

Not open to freshmen. Introduction to accounting and to business administration; theory of modern accounts; debit and credit; classification of accounts; procedures of recording transactions; preparation of balance sheets, profit and loss statements. (2 lecture, 2 lab hours.)

120A-B. Advanced Accounting (3-3)

Prerequisite: for 120A, Acct 1A-B; for 120B, Math 2 (may be taken concurrently). Preparation and analysis of balance sheet and income statements; partnership and corporation accounts; basic accounting theory; theory of current and fixed assets, investments, liabilities, funds, and reserves.

128. Managerial Accounting (3)

Not open to students with credit in Acct 120A or 132; not applicable for credit toward major in accounting. Prerequisite: Acct 1A-B. Uses of accounting data as an aid in business management; nature of accounting data, uses and limitations.

132. Cost Accounting (3)

Prerequisite: Acct 1A-B. Introduction to industrial cost accounting; general principles of job-order, process and standard cost systems; special problems.

144. Federal Tax Accounting (3) (Former Acct 144A-B)

Prerequisite: Acct 120A. Tax laws of the United States as they affect business and accounting procedures; preparation of personal, partnership, and corporate income tax returns; computation of capital stock, excess profits, estate, gift, and excise taxes.

155. Governmental Accounting (3)

Prerequisite: Acct 120A or 132. Accounting and financial reporting for municipal, county, state, and federal governments and institutions; budgetary control; types of funds; interpretation of governmental reports.

162. Auditing (3)

Prerequisite: Acct 120A-B (120B may be taken concurrently). Verification of accounts of a business to determine financial condition, operating results, and financial integrity of those in charge; duties and responsibilities of the auditor, his function in the executive staff and relation to the accounting department; balance sheet audit.

167. Advanced Accounting Problems (3)

Prerequisite: Acct 120A-B, or 120A and senior standing. Advanced accounting theory and practice; type problems in partnerships, consignments, installment sales, insurance, annuities, receiverships, branches, parent and subsidiary accounting, estates and trusts.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

199. Supervised Work Experience (1; max total 4)

Open only to accounting majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; analyzed in weekly class meeting.

200 series. Graduate courses are listed under *Business*.

BUSINESS

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

101G. Fundamentals of Economics (3)

Not open to students with credit in Econ 1A-B. Prerequisite: graduate standing. The pricing process in commodity and factor markets; national income analysis, income determination, and rates of growth.

105G. Essentials of Accounting (3)

Not open to students with credit in Acct 1A-B. Prerequisite: admission to MBA program. Basic accounting concepts; account construction; statement preparation, utilization, and interpretation; alternative bases of valuation in measurement of income and financial condition.

115G. Legal Environment of Business (3)

Not open to students with credit in Bus Ad 118A-B or 119. Prerequisite: graduate standing. Basic course in business law for master's degree students; nature of the legal system as it relates to business; law of contracts, sales, negotiable instruments, business associations (agency, partnerships, corporations).

200. Seminar in Business Research (3)

Business inquiry and decision-making by the scientific method of experimentation; applications to business problems.

203. Seminar in Office Management (3)

Prerequisite: Off Ad 103. Case studies, advanced problems, and research in office management; managerial control of office functions, services, and personnel.

220. The Administrative Process: Seminar in Business Policy (3)

Prerequisite: Bus Ad 120 or equivalent. Seminar in advanced problems in business policy; evaluation, determination, execution, administration, and control; policy objectives in integration of product, marketing, manufacturing, finance, and organization; analysis of administrative policy-making bodies and processes.

223. Human Relations and Business Leadership (3)

Prerequisite: Bus Ad 151 or equivalent. Problems of the individual and groups brought about by modern industrial organizations and techniques; motivations for work and cooperation between executives and different economic and social groups; analysis of effect of company policy on employee and public relations.

232. Money and Capital Markets (3)

Prerequisite: Bus Ad 133, 132, or 135. Analysis of money and capital markets in the United States; organization and interrelation, role in economic activity, impact of governmental fiscal and monetary policy on these markets.

240. Seminar in Marketing (3)

Prerequisite: Mkt 108 or permission of instructor. Critical review of the literature of marketing, special reports and research dealing with marketing institutions and organization, and marketing functions.

242. Marketing Management (3)

Prerequisite: Mkt 106 or permission of instructor. Seminar in the analysis of basic problems of marketing management and alternative methods of approaching these problems; case studies; use of statistics, economics, psychology, and other tools in directing marketing activities; relation of marketing to other areas of business administration.

250. Seminar in Personnel and Industrial Relations (3)

Prerequisite: Bus Ad 152, 153, or Econ 150. Trends and problems in management-employee relationships; administrative action in selection, motivation, and development of personnel; relation of personnel administration to other areas of management; concentrated study by each student of a special phase of personnel work.

252. Advanced Problems in Management-Union Relations (3)

Prerequisite: Bus Ad 151, 152. Background and process of collective bargaining; strategy techniques in contract negotiations; analysis of provisions of labor contracts; problems of contract administration; arbitration procedures; pathways to peace in management-union relations; practice in negotiating a labor contract.

260. Seminar in Accounting Theory (3)
Prerequisite: Acct 120A, 132. Seminar in development of accounting theory; current accounting theory; areas of accounting theory where professional differences exist; AICPA research bulletins, governmental regulations, recent literature, and accounting classics.

263. Seminar in Cost Accounting (3)
Not open to students with credit in Acct 133. Prerequisite: Acct 132. Advanced study of process and standard costs; overhead costs; budgeting; use of cost accounting data in economic analysis and managerial control; problems illustrating course material.

265. Accounting Systems (3)
Prerequisite: Acct 132, 162. Seminar in principles of system design and installation; correlation of accounting records and business activity.

267A-B. CPA Problems (2-2)
Prerequisite: Acct 162, 167 or equivalent. Advanced study of accounting theory; analysis and solution of type of problems given in CPA certification examination.

280. Seminar in Business Education (3)
Prerequisite: Bus 282, permission of instructor. Study of advanced problems in business education.

282. Principles of Business Education (3)
Seminar in objectives, principles, and curricula of business in secondary schools, including junior colleges; evaluation and trends of current programs.

290. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

291. Seminar in Business Theory and Practice (4)
Prerequisite: Acct 120A; Bus 220, 223; Bus Ad 124. For students in final semester of graduate program. Cases requiring the correlation and coordination of the several business functions; problems of management in terms of significance to over-all operation as distinguished from operation of component parts of the organization.

292. Readings in Business (2-3; max total 6)
Prerequisite: graduate standing and permission of instructor. Individually directed readings in a field of special concern to the student's graduate program; appropriate reports and evalution required. Individual conferences; no formal class meetings.

299. Thesis (2-4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Required for master of arts, elective for master of science.

389. Workshop in Business Education (1-6; max total 6)
Credit may not exceed one 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.

BUSINESS ADMINISTRATION

8. Survey of Business Law (3)

For nonbusiness students. Legal concepts common to all; rights, duties, and obligations in the law of contracts, sales and business torts; functioning of judicial institutions.

10. Foundations of the Enterprise System (3)

American business enterprises and their functions; case studies and practical problems illustrating current practices in business organization for production, distribution, and finance.

21. Business Mathematics (2)

Not open to students with credit in Bus Ad 22 or 27, Math 2 or 10. Fundamental operations and arithmetical processes; equations and use of formulas; application to specialized fields.

22. Business Data (3)

Not open to students with credit in Bus Ad 102. Prerequisite: one year high school algebra. Application of mathematical processes to business: marketing, economics, finance; introduction to statistics; compilation and classification of data.

27. Agribusiness Mathematics (3)

Not open to students with credit in Bus Ad 21. Basic mathematics for agriculture. Fundamental operations, percentage and interest, bank account reconciliation, equations, ratio and proportion, averages, areas and volumes, square root, measurement systems; applications to milk mixtures, fields, rations, tanks, silos, soils, lumber, concrete, personal buying and loans.

50. Business Lectures (1; max total 2)

Not open to freshmen. Points of view of business executives on current business developments; problems of various businesses presented by visiting lecturers.

61. COBOL Programming (1)

Introduction to the use of a compiler, oriented toward the handling of business data; study of the structure of COBOL (Common Oriented Business Language), organization of data and files, practice in COBOL processing.

100. Business Economics (3)

Prerequisite: Bus Ad 133, 151; senior standing. Application of economic principles in business management; measure of profit, analysis of demand, cost analysis; price, wage, and public policies; case studies.

102. Business Statistics (3)

Primarily for juniors. Prerequisite: Bus Ad 22 or Math B or equivalent; Econ 1A-B. Recommended: Off Ad 16. Principles and methods of statistical analysis; application to business and economic problems; collection of data, construction of tables and graphs, averages, measures of dispersion, statistical inference, index numbers, cycles, correlations; statistical methods in research, in analysis of business conditions, and in forecasting. (2 lecture, 2 lab hours.)

104. Business Forecasting (3)

Prerequisite: Bus Ad 102. Analysis of forecasting techniques currently utilized to estimate cyclical and secular-trend changes in both firm and industry output; correlation techniques, models, composite indexes; time series, lead-lag, and flow-of-funds analyses.

110. Principles of Management (3)

For juniors. Principles of business management; history and development, planning, organizing, directing, staffing, and controlling; applications to production, marketing, finance and personnel; ethics in business; case studies.

118A-B. Business Law (3-3)

Prerequisite: junior standing. (A) Sources, forms and expressions of law; general law of contracts; the law of agency, employment, and torts; case studies. (B) Law of bailments, shipments, sale of personal property and negotiable instruments; case studies.

119. Advanced Business Law (3)

Prerequisite: Bus Ad 118A-B. Law of partnerships, corporations, estates, real property acquisition, conveyances and transfers; encumbrances such as easements, leases, mortgages and liens; riparian rights and boundaries; wills, administration of estates, bankruptcy, debtor and creditor relations; case studies.

120. Management Problems and Policies (3)

Prerequisite: Bus Ad 100; senior standing. Analysis of business operations by case study, actual investigation, research and study; business policy, structural organization, and principles of management.

124. Production Management (3)

Prerequisite: Bus Ad 102, 110. Problems of production management: production planning; production control; purchasing and procurement; materials planning and control; product development; plant location. Field trip required.

129. Association Management (3)

Prerequisite: Bus Ad 110. Principles of management and operational problems applicable to chambers of commerce, trade associations, and similar community organizations.

132. Financial Institutions (3)

Prerequisite: Econ 1A-B, Acct 1A-B. Nature and services of various financial institutions such as commercial banks, savings banks, trust companies, insurance companies, investment banking and government credit agencies; emphasis is given to these institutions as sources of business funds; case studies.

133. Business Finance (3)

Primarily for juniors. Prerequisite: Econ 1A-B; Acct 1A-B. Case studies in promotion and financing of business enterprises; obtaining permanent and temporary fixed and working capital; bank loans and commercial paper borrowing; credit and collection policies; stock market and stock speculation; management of earnings; administration policies; expansion and reorganization.

134. Investments (3)

Prerequisite: Bus Ad 133. Channels for investment of funds; investment characteristics of stocks, bonds, and real estate mortgages; fundamentals of investment analysis; investment safeguards and investment policies.

135. Money and Banking (3)

Prerequisite: Econ 1A-B. Types of monetary systems, exchange standards, the international exchange, stabilization of the price level; nature, development, functions and control of the banking system; recent monetary and banking experience in the United States.

137. Principles of Credit Management (3)

Nature and principles of mercantile and consumer credit in modern business; derivation of credit information from business data; credit agencies and credit bureaus; valuation and ratio analysis of financial statements; technical and legal aspects of collections.

139. Financial Management (3)

Prerequisite: Bus Ad 133. Case studies and analysis of financial policies of business enterprise from the executive viewpoint; principles of effective management of the flow of funds through the individual firm under changing economic conditions; evaluation of alternative methods of financing, capital budgeting, valuation problems.

143. Property and Casualty Insurance (3)

Prerequisite: Bus Ad 8 or 118A (may be taken concurrently). Fundamental principles of insurance; descriptive, nontechnical study of property and casualty insurance and insurance carriers.

144. Life Insurance (3)

Prerequisite: Bus Ad 8 or 118A (may be taken concurrently). Principles of life insurance, nature and use, scientific basis, types and forms; organization, management and supervision of life insurance companies.

151. Personnel Management (3)

Primarily for juniors. Human relations in industry; case studies of labor-management relationship; methods of recruitment, selection, training; wage-payment plans; employee services, labor laws and application; collective bargaining methods and policies.

152. Labor Relations and Collective Bargaining (3)

Prerequisite: Bus Ad 151 or Econ 150. Relations between employers and organized employee groups; organization, election, and certification procedures; techniques of collective bargaining; basic clauses in labor contracts and their economic significance; administration of the written agreement; mediation and arbitration of disputes; determinants of labor-management conflict and peace.

153. Supervisory Training and Leadership Development (3)

Prerequisite: Bus Ad 151. Significant concepts and methods of leadership; improving ability of supervisors in dealing with individuals and groups; using primarily the democratic or job-enlargement approach, effecting attitudinal change and developing efficient techniques of group decision making.

154. Wage and Salary Administration (3)

Prerequisite: Bus Ad 151. Interaction of economic forces and institutional factors in wage determination; techniques of establishing wage programs; theory and procedures of job evaluation; establishment of job classifications and pay structures; wage determination under collective bargaining; incentive wage plans; special problems in wage and salary administration.

156. Labor Law (3)

Prerequisite: Econ 1A-B; Bus Ad 118A-B, 151. Recommended: Bus Ad 152, Econ 150. State and federal labor statutes, workmen's compensation, social security; procedures and methods in handling labor problems; leading decisions of courts and other bodies in settling labor-management disputes.

159. Field Work in Labor Relations (2; max total 4)

Prerequisite: Bus Ad 152. Consultations with labor and management representatives; observation of union meetings, grievance hearings, National Labor Relations Board proceedings, and contract negotiations; participation in planning and publicizing educational conferences. Group meetings and individual conferences.

160. Automation and Data Processing (3)

Prerequisite: Bus Ad 102 or equivalent. Records, reports and information in business, governmental, and industrial organizations; analysis of procedures, charting, form design, and control necessary to automation; survey of data processing machines and computers, principles; impact of automation on business and society. One field trip required.

161. Principles of Operations Research (3)

Prerequisite: Math B, Bus Ad 102. Quantitative methods in solving business problems; applications by various industries in fields of linear programming, queuing problems, inventory control problems, cost-value models, and problem simulation.

165. Work Simplification (2)

Recommended: work experience. Basic principles of motion economy and industrial engineering applied to office and shop; flow process charts, man and machine charts; social and personnel problems involved in work simplification procedures.

169. Practicum in Computer Programming (1-3; max total 3)

Prerequisite: Bus Ad 61, 160, Engr 70, or familiarity with IBM 1620 programming. Developing design and test models suitable for computer programming, with emphasis on accounting systems and simulation problems.

180. Urban Land Economics and Real Estate Principles (3)

Prerequisite: Econ 1A-B. Real estate principles and urban land economics; processes and patterns of land utilization where man and his artifacts are assembled in communities; determination of urban land use in a market process; economic competition among alternative uses; case studies.

181. Valuation of Real Property (3)

Prerequisite: Bus Ad 180. Theory of real property value; historical development; methods used in urban and rural property appraisals; special purpose appraisals. Field work required.

183. Urban Real Estate Investment and Management (3)

Prerequisite: Econ 1A-B. Case studies and problems in the acquisition, development, management, and sale of investment properties; for those interested in leasing, investing, or trading in real estate. Guest lecturers for certain specialized phases.

184. Real Estate Law (3)

Prerequisite: Bus Ad 118A-B or equivalent. Legal aspects of acquisition and ownership of real estate, especially in California; conveyances, mortgages, evidences of title; planning and zoning.

186. Land Use in Urban Areas (2)

Prerequisite: Bus Ad 180 or equivalent. Urban growth and development as a function of relative land values in different uses; real estate economics in relation to the use of land; urban growth as a result of investment decisions; analysis of such decisions.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

199. Supervised Work Experience (1; max total 4)

Open only to business administration majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; analyzed in weekly class meeting.

200 series. Graduate courses are listed under *Business*.

BUSINESS EDUCATION

117. Office Procedures for Teachers (2)

Prerequisite: proficiency in typing. Application of office machines to classroom instruction; use of the typewriter and duplicators (mimeograph and fluid) as teachers' tools; basic filing rules and filing of instructional materials; use of calculators in preparation of records and grades.

154. Objectives and Curricula in Business Education (2)

Trends and objectives of business education in secondary schools; comparison of current curricula; relationships of general and technical courses in the curriculum.

180. Teaching Methods in Typewriting (1)

Prerequisite: Off Ad 4. Modern methods in teaching of typewriting; application of psychological principles of skill building; evaluation of instruction.

181. Teaching Methods in Bookkeeping (2)

Prerequisite: Acct 1A-B or equivalent. Objectives, teaching procedures, and materials in teaching bookkeeping and related subjects, office and clerical practice, and business arithmetic; evaluation of instruction.

182. Teaching Methods in Secretarial Subjects (2)

Prerequisite: Off Ad 23, 112, 114, or equivalents. Modern methods in teaching shorthand, secretarial practice, transcription, and business correspondence; understanding principles underlying acquisition of a skill subject; evaluation of instruction.

183. Teaching Methods in Basic Business Subjects (2)

Prerequisite: Bus Ad 10, 118A, or equivalents. Application of educational principles and methods to basic business subjects, including elementary business training, salesmanship, business law, and other merchandising and general business subjects; techniques of teaching; evaluation of instruction.

186. Teaching Methods in Office and Clerical Practice (2)

Theory and practice of presenting teaching-learning materials for nonstenographic clerical training courses in high school; organization of materials; necessary equipment; adapting instruction to pupil ability levels; evaluation of instruction.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Business*.

MARKETING

10. Introduction to Marketing (3)

Students with credit in Mkt 10 may not take Mkt 100 for credit. Distribution of goods and services from the producer to the consumer, with emphasis on the products of the San Joaquin Valley; marketing functions—buying, selling, transporting, storing, standardizing and grading, risking, and financing.

100. Principles of Marketing (3)

Primarily for juniors. Not open to students with credit in Mkt 10. Prerequisite: Econ 1A-B. Economic and social problems involved in moving goods and services from the producer to the consumer; major kinds of goods and services to be marketed; the institutions and agencies of distribution, and the series of functions involved.

102. Marketing of Agricultural Products (3)

Basic marketing functions, policies, and problems involved in handling agricultural products; economic concepts, business decisions, and practical applications. (2 lecture, 2 lab hours)

105. Economics of Consumption (3)

Prerequisite: Econ 1A-B. Theory of consumption and consumer demand; analysis of the relation of the consumer to the price system; survey of efforts to improve the position of the consumer.

106. Marketing Problems (3)

Prerequisite: Mkt 10 or 100; 108 or 130 (may be taken concurrently). Distribution of goods and the rendering of services; case studies and current thought on problems of marketing, institutions and practices, from the standpoint of theory and technique.

108. Marketing Research (3)

Prerequisite: Econ 1A-B; Mkt 10 or 100; Bus Ad 102 (may be taken concurrently). Fundamentals of market and marketing analysis, research procedure, methods of analysis, applications of statistical techniques to market analysis, and presentation of results.

130. Principles of Retailing (3)

Prerequisite: Mkt 10 or 100. Various kinds of retailing organizations, their structure and management; store policies, merchandise control, personnel, retail credit, and store management.

132. Retail Buying (2)

Prerequisite: Bus Ad 22, Mkt 130, or equivalent. Problems of buying merchandise for resale; sources and markets; basic factors in planning, selecting, buying, pricing and selling of retail merchandise.

134. Merchandise Information (2)

Composition and construction of various kinds of retail merchandise; raw materials; line, color and design.

140. Introduction to Advertising (3) (Same as Jour 140)

An informational course for nonadvertising majors and an overview for advertising specialists. Social and economic functions of advertising; copy, art, layout production methods, media, campaigns, and advertising research.

141. Advertising Production and Media (2) (Same as Jour 141)

Prerequisite: Mkt 140 or equivalent. Techniques of advertising production; letterpress, photoengraving, lithography, silk-screen, typography, multicolor processes, and television; advantages and disadvantages of major media—newspapers, magazines, outdoor and poster advertising, direct mail, radio, television. Field trips are required.

144. Advertising Campaigns (2) (Same as Jour 144)

Prerequisite: Mkt 140. Market research, selection of campaign themes, copy preparation, art, and layout in various media for selected products and services; creating advertisements.

150. Principles and Psychology of Salesmanship (3)

Personal factors and techniques influencing other people; personal development, types of customers, mental and emotional appeals; mechanics and techniques of salesmanship.

155. Sales Management (2)

Prerequisite: Mkt 100, 150, or equivalent. Sales administration, planning and execution; marketing policies; planning and promotion; department organization; selection, training and management of the sales force; choice of channels of distribution; market research and analysis; and budgetary control.

176. International Marketing (3)

Prerequisite: Mkt 10 or 100. 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.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

199. Supervised Work Experience (1; max total 4)

Open only to marketing majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; analyzed in weekly class meeting.

200 series. Graduate courses are listed under *Business*.

OFFICE ADMINISTRATION

*** 1. Basic Typing (2)**

For students with no previous typewriting experience. Development of typewriting techniques and their applications to practical usage. Students with one or two semesters of high school typewriting should enroll in Off Ad 2.

*** 2. Intermediate Typing (1)**

Prerequisite: Off Ad 1 or equivalent. Students with more than one year of high school typing should enroll in Off Ad 4. Review of keyboard; development of typewriting technique and its application to business situations. (3 lab hours)

*** 4. Production Typing (2)**

Prerequisite: Off Ad 1, 2, or equivalent, or permission of instructor. Improvement of techniques, speed, and accuracy in typewriting; practice in letter writing, tabulating, centering, manuscript writing, outline writing, and other business forms and reports; emphasis on production of quantities of mailable copy. (6 lab hours)

14. Transcribing Machines (1)

Prerequisite: Off Ad 4 or equivalent. Instruction and practice in use of recording and transcribing machines. (3 lab hours)

15. Duplicating Machines (1)

Prerequisite: Off Ad 4 or equivalent. Instruction and practice in use of mimeograph, offset, fluid process duplicating machines, mimeoscope. (3 lab hours)

16. Machine Calculation (2)

Not open to entering freshmen. Basic operations in use of rotary calculators. (6 lab hours)

**** 23. Gregg Shorthand (4)**

Not open to freshmen. Prerequisite: adequate typing ability. Acquisition of proficiency in writing and transcribing shorthand notes.

* Not more than six units of credit in typing will be allowed toward any degree.
** Not more than ten units of credit in shorthand, dictation, and transcription will be allowed toward any degree.

103. Principles of Office Management (3)

Office management in business and industry; organization and control of office services; selection, training, and supervision of personnel; improvement of office efficiency; office planning and layout; equipment and supplies.

105. Business Communication (3)

Not open to students with credit in Sec Ad 5. Prerequisite: Engl 1 or Phil 3, and junior standing. Communications in business; development of skills needed for effective business writing and dictating.

107. Records Management (2)

Basic principles, rules and procedures of filing; individual practice in alphabetic, geographic, numeric, and subject filing; study of records organization, management, and control.

***112. Advanced Shorthand (3)**

Prerequisite: Off Ad 23 or one year high school Gregg or equivalent. Review of theory and development of proficiency in writing and transcribing shorthand notes; speed and endurance in writing and transcribing shorthand notes.

***114. Dictation-Transcription (2)**

Prerequisite: Off Ad 14 or equivalent, 112 (may be taken concurrently). Training in transcribing from shorthand notes; development of production standard for transcription of office-type dictation. (4 lab hours)

121. Office Services and Procedures (4)

Prerequisite: Off Ad 114 or equivalent. Duties and responsibilities of executive secretarial positions. (3 lecture, 3 lab hours)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

199. Supervised Work Experience (1; max total 4)

Open only to office administration majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; analyzed in weekly class meeting.

200 Series. Graduate courses are listed under *Business*.

* Not more than ten units of credit in shorthand, dictation, and transcription will be allowed toward any degree.

EDUCATION DIVISION

Division Head and Director of Teacher Education ..... Richard K. Sparks

Department	*Chairman*
Elementary Education	Glenn F. Leslie
Laboratory School	David Haimbach
Secondary Education	Stephen V. Ballou
Advanced Professional Studies	Morris L. Bigge
Health Education	Henry F. Fricker

The Education Division utilizes the resources of the college in the preparation of teachers, administrative officers, and special service personnel for elementary and secondary schools. Teacher education curricula are developed on the assumption that a teacher or administrative officer needs a broad and liberal education, and should be master of the subject or subjects he teaches. This training, which is supplemented by professional education, gives knowledge of pupils, familiarity with teaching problems, and meaning to the subjects of instruction.

Under the terms of the Licensing of Certificated Personnel Law of 1961, as amended by the 1963 session of the Legislature, the Education Division provides professional preparation in elementary teaching, secondary teaching, junior college teaching, pupil personnel services, health education, and administration and supervision. The master of arts degree program offered by the division permits concentration in any of these areas. Bachelor's degree majors in education are also offered on a limited basis.

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EDUCATION DIVISION

CREDENTIAL REQUIREMENTS

The new credential regulations adopted by the State Board of Education became effective on January 1, 1964. All candidates for any California credential who, on or before November 1, 1963, had not achieved at least junior standing in a college or university and who, as of that date, had not enrolled in a program leading to a credential authorized by regulations in effect on that date, must meet the new requirements.

Credentials based upon requirements in effect on November 1, 1963, will continue to be issued to qualified applicants until September 14, 1966 (see earlier General Catalogs). After that date, California School Service Credentials will be issued only in compliance with the Licensing of Certificated Personnel Law of 1961, as amended by the 1963 session of the Legislature, and the regulations of the State Board of Education based on that law. Holders of valid provisional credentials who are actively engaged in meeting regular credential requirements, or those whose education is interrupted by military service, may continue to work for existing credentials beyond the September 14, 1966, cut-off date.

Under the terms of the revised credential structure, five basic credentials authorizing public school service are established. The following includes a partial list of the specializations under the basic credentials for which course work is available at Fresno State College. For a complete list see the *California Administrative Code, Title 5*, Sections 6100-6590. Information regarding specific requirements for the credentials listed can be secured from the department indicated in the *Education Division*. See also section on *Degrees and Credentials*.

The Standard Teaching Credential

With a Specialization in Elementary Teaching (See *Elementary Education Department*)

With a Specialization in Secondary Teaching (See *Secondary Education Department*)

With a Specialization in Junior College Teaching (See *Secondary Education Department*)

Specialized Preparation Which May Be Substituted for a Minor

Teacher of Exceptional Children (See *Advanced Professional Studies Department*)

Area of Mentally Retarded

Area of Speech and Hearing Handicapped

The Standard Designated Subjects Teaching Credential

In Public Safety and Accident Prevention, including Driver Education and Driver Training Authorization (See *Health Education Department*)

The Standard Designated Services Credential

With a Specialization in Pupil Personnel Services (See *Advanced Professional Studies Department*)

Child Welfare and Attendance

Psychometry and Psychology

Pupil Counseling

With a Specialization in Health (See *Health Education Department*)

Service as a Nurse

The Standard Supervision Credential

(See *Advanced Professional Studies Department*)

The Standard Administration Credential

(See *Advanced Professional Studies Department*)

MAJORS AND MINORS IN SUBJECT MATTER FIELDS

Candidates for credentials under the revised regulations must complete a major and a minor in subject matter fields, one of which shall be defined as academic. The appropriate division or department should be consulted concerning the specific requirements for any major or minor. At the present time, the *California Education Code*, Section 13188, defines academic subject matter areas as the natural sciences, the social sciences, the humanities, mathematics, and the fine arts. Students should consult the respective departments or divisions for specific information concerning the classification of the majors and minors which they offer. Specialized preparation to teach exceptional children may be substituted for a minor (see *Advanced Professional Studies Department*).

EDUCATION MAJOR

The major in education consisting of 24 semester units of upper division work may be used as a basis for the bachelor's degree. Students selecting education as a degree major must also present a subject matter major and minor in order to qualify for a teaching credential. Students desiring to major in education should consult the head of the Education Division.

APPLICATION FOR ADMISSION TO CREDENTIAL PROGRAMS

Students planning to undertake a program of studies leading to a credential must file with the Education Division an application for admission to the credential program. This should normally be done during the first semester of the junior year. Candidates for credentials entering the college as juniors, seniors, or graduate students should make application immediately following admission to the college.

Under normal circumstances students will not be permitted to enroll in any of the professional course work leading to any credential until official admission to the credential program has been granted.

Acceptance for a credential program does not guarantee the granting of the credential, nor does acceptance for one credential or specialization imply acceptance for another credential or specialization.

The following minimum requirements must be met for acceptance to the minimum programs of professional preparation. Additional criteria may be used for acceptance to programs leading to professional master of arts degrees.

1. **Academic Aptitude.** Students who fall below the percentile rank of 25 on the college aptitude and reading tests must demonstrate compensating strength in other areas listed in the following sections.
2. **Scholarship.** Candidates for credentials with elementary specialization must present a minimum grade point average of 2.25 in the total college program. Candidates for credentials with secondary specialization must present a minimum grade point average of 2.50 in the total college program. A grade point average of at least 2.0 must be maintained in all work taken at Fresno State College.
3. **Professional Aptitude.** Ability to work with pupils, parents, and school officials must be demonstrated in field work assignments.
4. **Physical Fitness.** All candidates for public school credentials must pass a special medical examination by the staff of the college Student Health Service. Each candidate must make an appointment with the college physician and have this examination completed before admission to a credential program is approved.
5. **Language Usage.** Habitual use of clear, correct, and appropriate language, both written and oral, is required, including demonstrated competency in composition. This requirement is met by securing clearance statements in writing from both the English Department and Speech Arts Division. The Language Usage Committee reviews cases in which questions arise relative to this requirement.

6. **Personality and Character.** Personal qualifications required for professional service are expected. These include appearance, dress, poise, force, vitality, social attitudes, cooperativeness, temperament, emotional stability, integrity, and such personal habits and manners as are not offensive to pupils, coworkers, and school patrons.
7. **Many-sided Interests.** Participation in community enterprises, discussions of social problems, reading, music, conversation, social contacts, clubs, hobbies, and travel are considered important.
8. **General Fitness for Teaching.** Weakness in the foregoing items, or evidence of unfavorable traits of character or personality, will disqualify a student from candidacy for a credential program. Each candidate must secure approval from the Credentials Committee to continue through any credential program; full approval is granted upon satisfactory completion of all requirements listed above.

Additional requirements must be met by students seeking admission to the professional master's degree programs. For further information regarding these requirements, the department offering the desired degree should be consulted.

ELEMENTARY EDUCATION DEPARTMENT

(In the Education Division)

Professors: Leslie (Chairman), Rippey
Associate Professors: Bathurst, Brewster, Dandoy, Fast, Haimbach, Lambert, Sloan
Assistant Professors: Avery, Edgar, Fee, Henfling, Lundberg, J. Ch. Manning, J. E. Martin, C. Miller, Randolph, T. Rea, C. Smith
Part-time: Ham

Laboratory School

Principal: Haimbach
Teachers (grades): Bakkegard (Music), Bowers (K), Cady (4), Dow (2), Gerard (1), Meeker (6), Silvani (5), Whalen (3)
Librarian: Berry
Nurse: Emler

The Elementary Education Department provides professional preparation for the standard teaching credential with specialization in elementary teaching. The department also offers a program leading to the master of arts degree in education with concentration in elementary teaching.

COOPERATING PUBLIC SCHOOL DISTRICTS

The professional preparation program of the Elementary Education Department utilizes the services and facilities of a number of cooperating public school districts in the area for assignments in observation and student teaching. Public school teachers, administrators, consultants, and other personnel provide excellent opportunities for students to gain practical experience in the field.

The following school districts are currently cooperating in the college program of elementary education:

Clovis Unified School District
Fresno City Unified School District
Reedley Joint Elementary School District
Visalia City Elementary Schools

COLLEGE LABORATORY SCHOOL

The College Laboratory School is of special interest to students preparing for teaching and related fields. The school's philosophy, facilities, and program reflect the interest of the people of California for the education of their children. The school functions to provide demonstration, observation, participation, leadership, and some experimentation and research through its facilities and personnel to all persons interested in professional preparation and improvement. Group demonstra-

tions and individual study may be arranged in connection with courses taught on the college campus and as a service to educational units in the service area of Fresno State College. A diagnostic reading clinic provides limited service in the diagnosis of reading difficulty. The school consists of a kindergarten and six elementary grades housed in a modern elementary school surrounded by five acres of fenced campus. A children's library with more than 4,500 books is available within the school for use by college students as well as the pupils enrolled in the school. Selected teachers guide the program of studies for pupils in each grade. The curriculum of the elementary school implements the accepted *Framework for Public Education in California.* The school provides a laboratory in which students, in-service teachers, administrators, and parents may develop their understanding of children and of educational concepts and methods by observing and working with children. Demonstrations, observation, and individual study opportunities may be used in connection with such classes as psychology, growth and development, curriculum, arts, vocal and instrumental music, physical education, home economics, and family life education.

THE STANDARD TEACHING CREDENTIAL WITH SPECIALIZATION IN ELEMENTARY TEACHING

Candidates for the Standard Teaching Credential with Specialization in Elementary Teaching must complete four years of college or university education with a baccalaureate degree. In addition, a fifth year of college or university postgraduate education consisting of upper division or graduate courses must be completed. The credential can be issued on the basis of a partial fulfillment of requirements only under specific circumstances. For additional information concerning this aspect of the new credential law, consult the department chairman. Requirements for admission to the credential program are listed under *Education Division.* Completion of the college credential program entitles a candidate to the Standard Teaching Credential with appropriate endorsements, issued by the State Department of Education.

Candidates for the Standard Teaching Credential with Specialization in Elementary Teaching must complete the following requirements:

General Education

The general education requirements for credential candidates differ somewhat from those required for the bachelor's degree. Forty-five semester units of course work, including five of the six areas listed below, are required of credential candidates. Not more than six semester units of work taken to fulfill credential general education requirements can be used to meet the requirements for majors and minors. The degree general education requirements are listed in the section on *Degrees and Credentials.*

1. Humanities, excluding foreign languages for the purpose of this requirement, but including a year of English. In addition, the applicant shall demonstrate competence in composition, either by passing a course in composition or by passing an examination given by the institution. The English Department should be consulted concerning the specific requirement in English.
2. Social Sciences
3. Natural Sciences
4. Mathematics, requiring as a prerequisite, an understanding of high school algebra and geometry
5. Fine Arts
6. Foreign Language

As a part of the credential general education requirements, a 3-unit course dealing with the structural theory, arithmetic, and algebra of the real number system, or a 3-unit lower division course in calculus will be required of all students who do not meet this requirement under 4 above. Math 140 meets this requirement.

Majors

The candidate for the Standard Teaching Credential with Specialization in Elementary Teaching must complete a major selected from one of the classifications listed below:

1. Single Subject: Twenty-eight semester units of upper division or graduate course work constitute a major in the following subjects:

a. Agricultural Science
b. Business Education
c. Health Science
d. Home Economics
e. Industrial Arts
f. Physical Education

2. Twenty-four semester units of upper division or graduate course work in any one subject normally taught in the public schools and not listed under 1 above, constitute a major in that subject.

3. Diversified Major: Twenty-four semester units of upper division or graduate course work covering two or more subjects normally taught in the public schools constitute a diversified major. Diversified majors may be selected from the following groups:

a. Biological Sciences
b. Physical Sciences
c. Social Sciences
d. Humanities
e. Any Biological or Physical Science and Mathematics
f. One of the Fine Arts and a single subject in either the Humanities or the Social Studies.

Diversified majors in the biological sciences and the social sciences are listed in the *Biology Department* and under *Social Science*. Additional diversified majors are being developed.

Minors

In addition to the major, candidates for the Standard Teaching Credential with Specialization in Elementary Teaching must complete a satisfactory minor. A minor consists of twenty semester units in a single subject normally taught in the public schools. When the applicant's major is not in an academic subject matter area (see item 1 under *Majors* above) twelve semester units in the minor must be taken at the upper division or graduate level. When the major is in an academic subject matter area, there is no upper division requirement in the minor. Either the major or the minor must be in an academic subject matter area. Specialized preparation to teach exceptional children may be substituted for the minor (see *Advanced Professional Studies Department*).

Professional Preparation

The minimum professional requirements necessary to qualify for the Standard Teaching Credential with Specialization in Elementary Teaching include 21-22 units in the following courses:

	Units
E Ed 105, 107A-B, 132A-B	19
Elect one course from: E Ed 100, A Ed 184, 186, 187	2–3
	21–22

Students are not permitted to enroll in any of the courses listed under professional preparation until official admission to the credential program has been granted.

BACHELOR OF EDUCATION DEGREE AND ELEMENTARY CREDENTIAL

Only holders of a regular California provisional kindergarten-primary or provisional general elementary credential are eligible for admission to candidacy for the bachelor of education degree. Students admitted to candidacy for this degree may also qualify for the general elementary and kindergarten-primary credentials by including the requirements for these credentials within the requirements for the degree. Effective July 1, 1964, students will no longer be accepted to work toward a bachelor of education degree at Fresno State College.

MASTER OF ARTS DEGREE

The Elementary Education Department offers a program leading to the master of arts degree in education with a concentration in elementary teaching. Emphasis is on developing highly qualified professional personnel for the elementary schools. Prospective candidates can usually plan to coordinate many of the requirements for the master of arts degree in education with the fifth year which must be completed by every candidate for a standard teaching credential. A student may enter the master's degree program following completion of fifteen semester units of acceptable work in professional education or following completion of the minimum requirements for a standard teaching credential, provided all criteria for classified graduate standing have been met. In addition, students must also comply with policies and procedures established by the Education Division Graduate Committee (see *Advanced Professional Studies Department*).

For specific requirements consult the department chairman; for general requirements, see *Degrees and Credentials—Master's Degrees*.

Courses

ELEMENTARY EDUCATION (E Ed)

100. School and Society (3) (Former Ed 100) (Same as S Ed 100)

The place of education in American culture; role of the teacher; impact of social conflicts on the school's function; relationship between the school and community; designated field experience.

105. Development and Learning (3-4) (Former Ed 185) (See A Ed 105)

107A. Curriculum and Instructional Materials and Procedures (3)

Prerequisite: E Ed 105, 132A (concurrently); admission to credential program. Current conceptions of reading, spelling, written and oral communications; their roles in the elementary curriculum; effective teaching procedures.

107B. Curriculum and Instructional Methods and Procedures (4)

Prerequisite: E Ed 107A, admission to credential program. Current conceptions of history, geography, civics and the sciences; their roles in the elementary curriculum; effective teaching procedures, including audio-visual techniques.

110. General Methods of Teaching (2) (Former Ed 159) (See S Ed 110)

111. Social Studies in the Elementary School (3) (Former Ed 101)

Prerequisite: E Ed 105, admission to credential program. Recommended: E Ed 112, 113; concurrently E Ed 130, 131. Teaching the social studies; points of view, materials, unit planning, and procedures; contributions of other subjects to an adequate social studies program.

112. Reading in the Elementary School (3) (Former Ed 102)

Prerequisite: E Ed 105, admission to credential program. Concept of reading as a process; foundations of reading instruction; methods, materials, and instructional aids for teaching reading in the elementary school.

113. Language in the Elementary School (2) (Former Ed 103)
Prerequisite: E Ed 105, admission to credential program. Objectives, curriculum, materials, and procedures in language, spelling, and handwriting.

114. Children's Literature (3) (Former Ed 104)
Prerequisite: E Ed 105. Standards of selection for prose and poetry suitable for children from kindergarten through grade six; methods and practice in storytelling.

116. Problems in Teaching Reading (2) (Former Ed 116)
Prerequisite: E Ed 112, teaching experience or permission of instructor. Diagnostic and remedial techniques; improvement of comprehension, recall, skimming, organization, reading speed; provisions for individual differences in ability and interest.

117. Problems in Teaching Arithmetic (2) (Former Ed 107)
For teachers in service. Points of view, curriculum, units, instructional material, and procedures; assistance in solution of teaching problems in elementary grades.

118. Problems in Teaching Social Studies (2) (Former Ed 108)
For teachers in service. Points of view, curriculum, units, instructional material, and procedures; assistance in solution of teaching problems in elementary grades.

121. Childhood Education (3) (Former Ed 175)
Prerequisite: E Ed 105. Development of young children; methods of teaching in kindergarten and primary grades; unification of nursery school, kindergarten, and primary grades.

122. Outdoor Education (2) (Former Ed 122)
Prerequisite: E Ed 105, Biol 157 or PE 155. Philosophy of outdoor education; operation of school programs in outdoor education, school camping, and conservation education. At least one weekend at an outdoor school site.

122F. Field Work in Outdoor Education (1-2; max total 2) (Former Ed 122F)
Prerequisite: E Ed 105, Biol 157 or PE 155; permission of instructor. Practice at camp with responsibilities of counseling, camp leadership, curriculum planning and evaluation, and utilization of resource people from several disciplines.

126. Directed Observation for Teachers (1-4; max total 6) (Former Ed 106)
Does not duplicate and may not substitute for E Ed 131. For teachers in service, primarily provisionally credentialed teachers. Directed observation to accompany theory classes.

130. Extra-Instructional Activities in Elementary Schools (2) (Former Ed 130)
Prerequisite: sixth semester, E Ed 105. Recommended E Ed 112, 113; concurrently E Ed 111, 131. Activities of teachers outside the curricular fields.

131. Observation and Participation (1-4) (Former Ed 131)
Prerequisite: admission to credential program; 6 units in education and/or concurrently 5 units from E Ed 111, 112, 113. Directed exercises in observation and participation to prepare for teaching, develop traits and qualities which make for success in teaching, and provide basic experiences for interpreting theories developed in parallel education courses.

132A. Student Teaching in Elementary Schools (3) (Former Ed 132)
Prerequisite: E Ed 107A (concurrently); admission to credential program. Observation and participation and a minimum of 45 clock hours of directed teaching with one hour conference weekly.

132B. Student Teaching in Elementary Schools (2-12) (Former Ed 132)
Prerequisite: E Ed 132A or equivalent; one semester residence; admission to credential program. Directed teaching, participation, and teaching in public schools under supervision. Weekly conference with college supervisor.

133. Curriculum of the Elementary School (2) (Former Ed 153)
Does not duplicate and may not substitute for E Ed 250. For in-service teachers only. Principles, backgrounds, and organization of curriculums; scope, grade placement, selection, and teaching of subject matter.

135. Audio-Visual Education (2) (Former Ed 109) (Same as S Ed 135)
Prerequisite: E Ed 105. Types and use of materials and equipment in the classroom; laboratory work in operation of equipment and appraisal of materials.

137. Dramatization in Elementary Education (2) (Former Ed 137) (See Drama 137)

138. Workshop in Elementary Education (1-4; max total 4) (Former Ed 178)
Practical assistance in solution of classroom problems in elementary school teaching; problems determined by in-service teachers enrolled.

141. Elementary Education (2) (Former Ed 171)
Prerequisite: E Ed 105. Nature and functions of public elementary education; role of the teacher in the community-centered school; framework for education in California.

146. In-Service Child Study (1-2; max total 4) (Former Ed 186)
Prerequisite: E Ed 105 or Psych 119, teaching experience. Child-study skills and techniques adaptable for use by the regular classroom teacher; methods of studying individuals in classroom groups; case studies.

157. Conservation of Natural Resources (3) (Former Ed 157) (See Biol 157)

158. Speech for the Classroom Teacher (3) (Former Ed 158) (See Spch 158)

180. Modern Trends in Education (1-4; max total 4) (Former Ed 176) (Same as S Ed 180)
Recent trends in educational objectives; selection and revision of curricular materials; methods of instruction.

185. In-Service Curriculum Development (1-4; max total 4) (Former Ed 179) (Same as S Ed 185)
Prerequisite: E Ed 141 or S Ed 156; A Ed 105, teaching experience. Methods of evaluating and improving curriculum on problems identified by the participants; problems may be systemwide or involve only one subject in one school.

190. Independent Study (1-3; max see reference) (Former Ed 190)
(See Regulations and Procedures—Independent Study.)

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

220. Research in Education (2) (Former Ed 220) (See A Ed 220)

250. Elementary School Curriculum Development (3) (Former Ed 250)
Prerequisite: teaching credential or permission of instructor. Seminar on concepts and principles of curriculum planning; evaluation of processes and programs; availability and use of resources; innovations and research in curriculum development. Project required.

275. Workshop in Curriculum Development (1-6; max total 6) (Former Ed 278) (Same as S Ed 275)

Practical assistance in solving curriculum problems; problems determined by in-service teachers enrolled.

280. Current Problems in Education (3) (Former Ed 283) (See A Ed 280)

290. Independent Study (1-3; max see reference) (Former Ed 290)

See *Regulations and Procedures—Independent Study*.

298. Seminar in Teaching Theory and Practice (4) (Former Ed 298) (See A Ed 298)

299. Thesis (2-4; max total 4) (Former Ed 299)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

381. Planning and Organizing Outdoor Education (2) (Former Ed 380)

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. (Seminars, lab, field trips)

383. Problems in Child Study (2; max see below) (Former Ed 383)

Maximum total credit in E Ed 383 and E Ed 146 combined, 12 units provided no study area repeated. Methods of studying children; relationship of child study groups; review of research findings in child development and adolescent behavior.

395. Supervision of Student Teachers (2; max total 4) (Former Ed 382) (See S Ed 395)

SECONDARY EDUCATION DEPARTMENT

(In the Education Division)

Professors: Ballou (Chairman), R. F. Evans, Murphy
Associate Professor: Gilbert
Assistant Professors: Saville, A. Smith

Departmental Supervisors

Department
Agriculture: Ball
Art: S. Williams, W. Williams
Biology: D. Falk
Business: H. Rohrer, Wayne
Chemistry: Vavoulis
English: Billings, D. Smith
Foreign Language: Kinzel, List, Poythress
Geography: A. Johnson
Health Education: Fricker
Home Economics: Johnston, Monts, Porch, Sollie
Industrial Arts: Dettinger, Noakes
Journalism: Duke
Mathematics: Alkire
Music: Bakkegard, R. Rea
Nursing: Gardner
Physical Education—Men: H. Beatty, Burgess
Physical Education—Women: Hupprich, Mason
Physics: Shockley
Psychology: Lindquist
Social Science: Roth
Speech: Campbell

The Secondary Education Department provides professional preparation, advising, and evaluating services to students in secondary education. General responsibility for the standard teaching credential with specialization in secondary teaching is assigned to this department. Information is also available regarding junior college teaching. The department includes in its program the master of arts degree in education with concentration in secondary teaching.

COOPERATING PUBLIC SCHOOL DISTRICTS

The professional preparation program of the Secondary Education Department utilizes the services and facilities of a number of cooperating public school districts in the area for assignments in observation and student teaching. Public school teachers, administrators, consultants, and other personnel provide excellent opportunities for students to gain practical experience in the field. The department works closely with the public schools in planning and implementing credential programs. A School and College Secondary Liaison Committee has been established to serve this purpose.

The following school districts are currently cooperating in the college program of secondary education:

Central Union High School District
Clovis Unified School District
Fresno City Unified School District
Sanger Union High School District
Selma Union High School District

THE STANDARD TEACHING CREDENTIAL WITH SPECIALIZATION IN SECONDARY TEACHING

Candidates for the Standard Teaching Credential with Specialization in Secondary Teaching must complete four years of college or university education with a baccalaureate degree. In addition, a fifth year of college or university postgraduate education consisting of upper division or graduate courses must be completed. Requirements for admission to the credential program are listed under *Education Division.* Completion of the college credential program entitles a candidate to the Standard Teaching Credential with appropriate endorsements, issued by the State Department of Education.

Candidates for a Standard Teaching Credential with Specialization in Secondary Teaching, authorizing assignment in grades 7 through 12 in major and minor subjects, must complete the following requirements:

GENERAL EDUCATION

The general education requirements for credential candidates differ somewhat from those required for the bachelor's degree. Forty-five semester units of course work, including the English and the competency requirements in composition described in paragraph 1 below are required of secondary credential candidates. Course work must be taken in at least *four* of the six areas included in the following list. Not more than six semester units of course work taken to satisfy this requirement shall apply toward the fulfillment of the requirements for a major or a minor. The degree general education requirements are listed in the section on *Degrees and Credentials.*

1. Humanities, excluding foreign language for the purpose of this requirement, but including a year of English. In addition, the applicant shall demonstrate competence in composition, either by passing a course in composition, or by passing an examination given by the institution.
2. Social Sciences.
3. Natural Sciences.
4. Mathematics, requiring as a prerequisite an understanding and knowledge of high school algebra and geometry.
5. Fine Arts.
6. A Foreign Language: This requirement may be satisfied by passing an examination given without college credit. If the work for the credential is to be completed prior to September 1, 1967, two full years of study in a single foreign language successfully completed in high school may be used to satisfy this requirement.

MAJORS AND MINORS

Candidates for the Standard Teaching Credential with Specialization in Secondary Teaching must complete a major and a minor in subject matter areas normally taught in the public schools, one of which shall be in an academic subject matter area and one of which may be in a nonacademic subject matter area. Majors are classified as follows:

1. Single Subject: Twenty-four upper division or graduate semester units, six of which are taken in graduate level courses. If six semester units are taken in graduate level courses in the minor, the requirement does not apply to the major. For purposes of this requirement, each of the following, among other subjects, is considered to be a single subject:

a. Agricultural Science
b. Business Education
c. Health Science
d. Home Economics
e. Industrial Arts
f. Nursing Education
g. Physical Education

2. Interdepartmental: Twenty-four upper division or graduate semester units, at least fifteen of which must be in one of the subject matter areas constituting the interdepartmental major. The fifteen-unit concentration constitutes a single subject major for the purpose of satisfying credential requirements. Interdepartmental majors may be offered in the following subject matter areas:

a. Biological Sciences
b. Physical Sciences
c. Social Sciences
d. Humanities
e. Any Biological Science or Physical Science
f. Fine Arts

3. Minors: A minor consists of twenty semester units in a single subject normally taught in the public schools. When the minor is in an academic area, no upper division units are required as a part of the minor. When the major is classified as nonacademic, twelve semester units of upper division or graduate work must be taken as part of the minor. Specialized preparation to teach exceptional children may be substituted for the minor (see *Advanced Professional Studies Department*).

PROFESSIONAL PREPARATION

The minimum professional requirements necessary to qualify for the Standard Teaching Credential with Specialization in Secondary Teaching includes at least one course in each of the categories listed below, including 6 units of student teaching, to total a minimum of 15 semester units:

	Units
S Ed 100, 151, A Ed 184, 186 or 187	2–5
S Ed 105, 152	3–5
S Ed 110, 153	2–5
S Ed 161 or equivalent	2
S Ed 166 (in major and minor fields)	6
	15–23

THE STANDARD TEACHING CREDENTIAL WITH SPECIALIZATION IN JUNIOR COLLEGE TEACHING

Candidates for the Standard Teaching Credential with Specialization in Junior College Teaching authorizing assignments primarily in grades 13 and 14, may complete the necessary professional requirements in the Secondary Education Department. The minimum requirements for the credential are included in the following statements:

a. General Education: The requirements are the same as those for the specialization in secondary teaching given above.

b. Major and Minor: A master's or higher degree granted by an approved institution in a single subject normally taught in the public schools is required. For purposes of this requirement, each of the following, among other subjects, is considered to be a single subject:

a. Agricultural Science
b. Business Education
c. Engineering
d. Health Science
e. Home Economics
f. Industrial Arts (including Industrial Technology)
g. Law
h. Nursing Education
i. Physical Education

A master's or higher degree granted by an approved institution on the basis of an interdepartmental graduate major may be used. Such a major must include twelve semester units of graduate work in a single subject. The twelve semester unit concentration constitutes a single subject major for the purpose of satisfying credential requirements.

The requirements in the minor are the same as those indicated for the specialization in secondary teaching. The minor may be taken in whole or in part before or after the baccalaureate or higher degree is conferred.

Professional Preparation for Junior College Specialization

Minimum professional requirements for this teaching specialization are listed below:

a. At least three semester units of course work in either or both of the following: (1) psychological foundations of education; (2) curriculum and instructional procedures and materials.

b. Student Teaching: A minimum of three semester units of student teaching is required in a junior college, or in the lower division of a college or university approved by the State Board of Education. Students should consult the Secondary Education Department Chairman regarding student teaching and other professional requirements.

MASTER OF ARTS DEGREE

The Secondary Education Department offers a program leading to the master of arts degree in education with a concentration in secondary teaching. Emphasis is on developing highly qualified professional personnel for the secondary schools. Prospective candidates can usually plan to coordinate many of the requirements for the degree with the fifth year of work which must be completed by every candidate for a standard teaching credential. A student may enter the master's degree program following completion of fifteen semester units of acceptable work in professional education or following the meeting of minimum requirements for a standard teaching credential, provided all criteria for classified graduate standing have been met. In addition, students must also comply with policies and procedures established by the Education Division Graduate Committee (see *Advanced Professional Studies Department*). For specific requirements consult the department chairman; for general requirements, see *Degrees and Credentials—Master's Degrees*.

Courses

SECONDARY EDUCATION (S Ed)

100. School and Society (3) (Former Ed 100) (See E Ed 100)

105. Development and Learning (3-4) (Former Ed 185) (See A Ed 105)

110. General Methods of Teaching (2) (Former Ed 159) (Same as E Ed 110)

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.

135. Audio-Visual Education (2) (Former Ed 109) (See E Ed 135)

151. Cultural Foundations of Education (5) (Former Ed 127)

Prerequisite: Soc 1A, Anthro 2, or permission of instructor; admission to credential program. Education in the United States, philosophical influences, socio-economic factors, educational developments and trends; professional bases of teaching; scope, function, and desirable outcome of public education; current educational issues. Minimum of 20 hours of field experiences in schools and related agencies.

152. Psychological Foundations of Education (5) (Former Ed 128)

Not open to students with credit in S Ed 105. Prerequisite: S Ed 151 or permission of instructor; admission to credential program. Educational psychology; theories of growth and learning; concepts of growth, learning, mental hygiene, and personality development; implications for instruction and guidance programs. Minimum of 1 hour per week or 20 hours per semester of guided observation and participation.

153. Curriculum and Instruction (5) (Former Ed 129)

Not open to students with more than 3 units of credit in A Ed 126, S Ed 110, 135. Prerequisite: S Ed 152. Theory and practice of curriculum development; principles and organization of instruction; audio-visual education, classroom management and discipline, measurement and evaluation. Minimum of 1 hour per week or 20 hours per semester of guided observation and participation in public schools. (4 lecture, 2 lab hours)

156. Secondary Education (2) (Former Ed 173)
Prerequisite: S Ed 105 or permission of instructor. Development of secondary education in America; objectives, administrative characteristics, curricular and extracurricular features, articulation with other school divisions, types of students served, methods of instruction, guidance, community relationships.

161. Methods and Materials in Secondary Teaching (2) (Former Ed 160)
Prerequisite: S Ed 105, admission to credential program. Psychological and social foundations of methods; instructional aids and resources for teaching in student's major and/or minor fields; comparison of newer and traditional practices; classroom organization and management; evaluative techniques.

163. Observation and Participation (1-4) (Former Ed 131)
Prerequisite: admission to credential program; 6 units in education. Directed exercises in observation and participation to prepare for teaching, develop traits and qualities which make for success in teaching, and provide basic experiences for interpreting theories developed in parallel education courses.

166. Student Teaching: Secondary (1-9) (Former Ed 133)
Prerequisite: completion of credential major and minor prior to, or concurrently with, final student teaching assignment; one semester residence; admission to credential program. Directed observation, participation, and teaching in public schools under supervision. Weekly conference with college supervisor.

180. Modern Trends in Education (1-4; max total 4) (Former Ed 176) (See E Ed 180)

185. In-Service Curriculum Development (1-4; max total 4) (Former Ed 179) (See E Ed 185)

190. Independent Study (1-3; max see reference) (Former Ed 190)
(See *Regulations and Procedures—Independent Study.*)

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

220. Research in Education (2) (Former Ed 220) (See A Ed 220)

251. Secondary School Reading (2) (Former Ed 215)
Prerequisite: S Ed 105, teaching experience or permission of instructor. Recommended: A Ed 174; educational measurements course. Nature of reading; observation and analysis of reading behavior and needs of secondary school pupils; development of reading materials and techniques for specific needs.

253. Secondary School Curriculum Development (3) (Former Ed 253)
Prerequisite: teaching credential or permission of instructor. Seminar on concepts and principles of curriculum planning; evaluation of processes and programs; availability and use of resources; innovations and research in curriculum development. Project required.

258. The Junior College (2) (Former Ed 273)
The junior college movement in America, with emphasis upon California; role of junior colleges; characteristics of junior college students and programs; problems of general and terminal education.

275. Workshop in Curriculum Development (1-6; max total 6) (Former Ed 278) (See E Ed 275)

280. Current Problems in Education (3) (Former Ed 283) (See A Ed 280)

290. Independent Study (1-3; max see reference) (Former Ed 290)
(See *Regulations and Procedures—Independent Study.*)

298. Seminar in Teaching Theory and Practice (4) (Former Ed 298) (See A Ed 298)

299. Thesis (2-4; max total 4) (Former Ed 299)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

362. Adult Education (2; max total 4) (Former Ed 362)

Prerequisite: teaching experience. Problems of adult education; basic methods for adults; principles and purposes; programs and sponsoring agencies, organization and financing, public relations and community involvement.

395. Supervision of Student Teachers (2; max total 4) (Former Ed 382) (Same as E Ed 395)

Prerequisite: graduate standing, teaching experience. Supervision and evaluation of student teachers; role of the supervising classroom teacher, college supervisor, and other personnel.

ADVANCED PROFESSIONAL STUDIES DEPARTMENT

(In the Education Division)

Professors: Bigge (Chairman), F. Brown, R. H. Harrison, Harton (Special Education Coordinator), Hunt, Kremen (Pupil Personnel Services Coordinator), Meeks.
Associate Professors: Mach, Wilcox (Administration-Supervision Coordinator)
Assistant Professor: Griffiths
Part-time: C. Clark, G. Graves, LeCount, Schroer, Snyder, K. Wood

The Advanced Professional Studies Department serves as a central administrative unit for all graduate degree programs within the Education Division and offers the master of arts degree in education with concentrations in administration and supervision, counseling and guidance, and educational theory. The department also provides preparation for educational specializations which require advanced study beyond the teaching credential. Information is available in the department on credentials in supervision, administration, and pupil personnel services and on specialized preparation for teachers of exceptional children.

COOPERATING PUBLIC SCHOOL DISTRICTS

The professional preparation program of the Advanced Professional Studies Department utilizes the services and facilities of a number of cooperating public school districts in the area for assignment of students to specialized field work. Public school teachers, administrators, consultants, and other personnel provide excellent opportunities for students to gain practical experience in pupil personnel, special education, supervisory, and administrative work.

THE STANDARD SUPERVISION CREDENTIAL

The Standard Supervision Credential permits service as a supervisor, consultant, coordinator (or other intermediate administrative position), and principal, when specifically authorized. The level at which a holder of this credential may serve in the capacities indicated above is determined by the level of the teaching credential held. See department chairman for requirements for admission to the credential program.

REQUIREMENTS

The minimum requirements for the Standard Supervision Credential are as follows:

1. Six years of college or university education in an approved institution, including two years of acceptable postgraduate work.
2. A master's degree or other postgraduate degree requiring not less than five years of college or university work, or in lieu of the degree, the certification by an approved institution that the completed graduate work is the equivalent of a master's degree. If the master's degree or the certificate of equivalency is not based on an academic subject matter area, the postgraduate work must include twelve semester units of work in academic subject matter.
3. The possession of a valid basic teaching credential.
4. Five years of successful full-time teaching experience in public elementary schools, secondary schools, or private schools of equivalent status.

PROFESSIONAL PREPARATION

The program of professional preparation for this credential requires course work in accordance with the distribution listed below. The professional requirements cover approximately one of the two postgraduate years needed for The Standard Supervision Credential.

1. The organization and administration of school systems: A Ed 261, 264, 266
2. Personnel administration: A Ed 262
3. Development and evaluation of instructional programs: A Ed 263
4. Work related to specialized functions, including services as a principal or supervisor: appropriate courses from the following in consultation with the adviser: A Ed 154, 186, 187, 224, 225, 226, 240, 241, 242, 262
5. Supervised field experiences: A Ed 268, 269
6. Electives: Sufficient units in education and related fields selected in consultation with the adviser to total the required program as indicated in *California Administrative Code, Title 5*, Section 6554.

THE STANDARD ADMINISTRATION CREDENTIAL

The Standard Administration Credential authorizes the holder to serve as a superintendent, assistant superintendent, or in an equivalent intermediate administrative position. The credential also permits service as a principal and supervisor at all grade levels provided the holder possesses a valid Standard Teaching Credential or a valid General Teaching Credential and his college or university preparation included a major in an academic subject matter area. See department chairman for requirements for admission to the credential program.

REQUIREMENTS

The minimum requirements for the Standard Administration Credential shall include all of the following:

1. Seven years of college or university education, or its equivalent in an approved institution, including three years of acceptable postgraduate education.
2. A master's degree in an academic subject matter area or, in lieu of the degree, certification by an approved institution that does not grant a master's degree in the applicant's subject matter major to the effect that work equivalent to the master's degree has been completed.
3. The possession of a valid Standard Teaching Credential or a valid General Teaching Credential other than a credential issued on partial fulfillment of requirements or postponement of requirements and other than a provisional, limited, or exchange credential.
4. A minimum of five years of successful full-time classroom teaching experience in public elementary or secondary schools, or in private schools of equivalent status.

PROFESSIONAL PREPARATION

The three years of acceptable postgraduate work shall include graduate course work in professional education and related fields as indicated below:

1. Legal and financial aspects of education: A Ed 264, 266
2. School management: A Ed 267, 270, 271
3. Education and school administration in the community: A Ed 286
4. Staff development and advanced techniques of personnel management: A Ed 275
5. Curriculum development, evaluation and research: E Ed 250 or S Ed 253
6. Supervised field work experiences: A Ed 268
7. Electives: sufficient units in education and related fields selected in consultation with the adviser to total the required program as indicated in *California Administrative Code, Title 5*, Section 6561.

THE STANDARD DESIGNATED SERVICES CREDENTIAL WITH A SPECIALIZATION IN PUPIL PERSONNEL SERVICES

A Standard Designated Services Credential with a Specialization in Pupil Personnel Services includes the following designated services: Child Welfare and Attendance; Pupil Counseling, including rehabilitation counseling; Psychometry and Psychology; and Social Work. Since the requirements differ for the various designations that may appear on the credential, and since only a brief summary of the requirements is included here, it is essential that the student planning to work toward this credential consult the Coordinator of the Pupil Personnel Services Credential Program as early as possible and be admitted to the credential program.

REQUIREMENTS

In general, the basic requirements for the Standard Designated Services Credential with a Specialization in Pupil Personnel Services are described below.

1. A master's or higher degree from an approved institution. The master's degree must be in social work, rehabilitation counseling, counseling, psychology, or an academic subject matter area, depending upon the specialty the student wishes to have designated on his credential.

2. Sixty semester hours of postgraduate work of upper division or graduate level in the area of pupil personnel services taken in an approved institution. The master's degree program may be included within the required sixty semester units, provided all of the requirements can be met.

3. Applicants who have completed three years of successful full-time teaching experience may substitute for one-half of the required sixty semester units of course work in pupil personnel services, thirty semester units in other areas. This does not relieve the applicant of the sixty-unit requirement. It does, however, enable the experienced teacher to substitute thirty units of postgraduate work in other fields for one-half of the sixty-unit requirement in courses directly related to the pupil personnel services. In the event that an applicant elects to make such a substitution, only the Child Welfare and Attendance and Pupil Counseling designations will appear on the credential.

4. Applicants seeking Psychometrist and Psychologist designations may not make the substitution indicated under paragraph 3 above. Those who desire these designations must secure verification of their competency to administer psychological examinations and to recommend placement based upon the use of individual psychological examinations. Such institutional verifications are based on the completion of specific course work in psychology and psychological testing.

5. Candidates for the Standard Designated Services Credential with Specialization in Pupil Personnel Services must also complete appropriate supervised field experiences. This may be accomplished either by the completion of an approved pupil services internship, or by the completion of 480 clock hours of supervised field experience, at least half of which must be in a school serving students between the ages of 4 and 21 years of age. Successful work experience may be substituted for 480 clock hours of supervised field experience at the rate of one-half of the requirement for each one year of full-time counseling experience and/or three years of full-time teaching experience.

PROFESSIONAL PREPARATION

Candidates for the standard credential authorizing the various designated pupil personnel services must complete, as part of the total requirements for the credential, specific course work in the areas listed below:

1. Pupil personnel services, concept and procedures
2. Counseling theory and procedures
3. Dynamics of individual behavior

4. Measurement theory and procedures
5. Group processes, theory and procedures
6. Educational and career planning
7. Research methodology
8. Remedial and special education
9. Laws relating to children
10. Organization of pupil personnel services

For more specific information regarding the program leading to the Standard Designated Services Credential with Specialization in Pupil Personnel Services, the student should consult the Coordinator of the Pupil Personnel Services Program, at the earliest possible date prior to beginning work on the credential.

SPECIALIZED PREPARATION TO TEACH EXCEPTIONAL CHILDREN

SPECIALIZED PREPARATION WHICH MAY BE SUBSTITUTED FOR A MINOR

Specialized preparation to teach exceptional children may be substituted for the required minor in each of the programs leading to the Standard Teaching Credential with Specializations in Elementary Teaching, Secondary Teaching, and Junior College Teaching. Students wishing to make the substitution with specialized preparation in the area of the mentally retarded or in the area of the speech and hearing handicapped should consult the Coordinator of Special Education not later than the second semester of the sophomore year. Students electing to substitute specialized preparation for the minor must select a major in an academic subject matter area.

AREA OF MENTALLY RETARDED

The course work for specialized preparation in the area of the mentally retarded includes the following 22 semester units and 4 units in student teaching:

	Units
Psych 167, 168	6
A Ed 115F, 160, 162, 163 (4 un)	11
Sp Corr 150, Art 135	5
Elect from: Sp Corr 151, 152, 162, Psych 175, A Ed 176	4
	26

AREA OF SPEECH AND HEARING HANDICAPPED

The course work for specialized preparation in the area of speech and hearing handicapped includes the following 37 units and 10 units in clinical practice and student teaching:

	Units
Psych 119, 168	6
Sp Corr 150, 151, 152, 153, 154, 156, 157, 162, 163, 164	23
Approved electives	8
	37
Professional Requirements: Sp Corr 155 (6 un), A Ed 164 (4 un)	10
	47

(Recommended: Psychology minor for speech correction-audiology)

For additional information consult the speech correction adviser in the *Speech Arts Division.*

MASTER OF ARTS DEGREE

The Division Graduate Office is maintained by the Advanced Professional Studies Department to provide a record center for all students in the Education Division who are working toward the master of arts degree in fields of concentration listed below, in elementary and secondary teaching, and in health education. The Division Graduate Committee develops working policies for the administration of the graduate degree programs within the division and serves as a board to consider problems relating to student graduate programs.

The Advanced Professional Studies Department offers the master of arts degree in education with concentrations in administration and supervision, counseling and guidance, and educational theory. Students may plan their programs of study so that they will qualify for the master of arts degree and the desired advanced credential with a nominal amount of additional time beyond that required for the credential alone. The master of arts degree in educational theory is available for students who may already hold an advanced credential or who do not wish to relate their study for an advanced degree to a particular credential.

For specific requirements for the master of arts degree consult the department chairman; for general requirements, see *Degrees and Credentials—Master's Degrees.* Students must also comply with policies and procedures established by the Education Division Graduate Committee.

Courses

ADVANCED PROFESSIONAL STUDIES (A Ed)

104. Lectures in Development and Learning (2) (Former Ed 184)

Not open to students with credit in A Ed 105. Prerequisite: a course in educational psychology or learning, or in child or adolescent development; permission of instructor. Lectures on principles of learning, or on aspects of child and adolescent development. Does not include field work.

105. Development and Learning (3-4) (Former Ed 185) (Same as E Ed-S Ed 105)

Not open to students with credit in Ed 113. Facts, ideas, and principles fundamental to an understanding of educational procedures in teaching and learning, and to the growth and development of children. (3 units, 3 lectures; 4 units, 3 lecture, 2 observation hours)

112. School Public Relations (2) (Former Ed 112) (See Jour 112)

115F. Field Work With Exceptional Children (1) (Former Ed 115F) (See Psych 115F)

143. Radio and Television in Education (2) (Former Ed 143) (See R-TV 143)

143L. Radio and Television Education Laboratory (1) (Former Ed 143L) (See R-TV 143L)

150. Introduction to Speech Correction (2) (Former Ed 150) (See Sp Corr 150)

151. Lip Reading and Auditory Training (2) (Former Ed 161) (See Sp Corr 163)

153. Elementary Statistics (3) (Former Ed 125)

Not open to students with credit in Psych 25. Methods of collecting, organizing, interpreting, and applying data in quantitative studies.

154. Measurement in Education (3) (Former Ed 126)

Objective measurement of capacities and achievement of pupils; construction of informal, objective examinations and criteria for selection of standardized measuring instruments; planning and administering a measurement program.

160. Education and Guidance of Exceptional Children (3) (Former Ed 114)
Not open to students with credit in Psych 115. Prerequisite: Psych 168. Historical development, status and trends in education, and legal provisions for atypical children; guidance of the handicapped. (2 lecture, 2 supervised field hours)

162. Curriculum and Methods: Mentally Retarded and Slow Learner (2) (Former Ed 166)
Methods of instructing the mentally retarded child and slow learner; examination and demonstration of materials. Field trips.

163. Student Teaching: Mentally Retarded (1-4) (Former Ed 135)
Prerequisite: completion of student teaching requirement for a basic teaching credential; one semester residence; admission to the credential program. Directed observation, participation and teaching in classes for the mentally retarded in public schools under supervision. Weekly conference with college supervisor.

164. Student Teaching: Speech Correction and Lip Reading (1-4) (Former Ed 134)
Prerequisite: 4 units of Sp Corr 155; completion of student teaching requirement for a basic teaching credential; one semester residence; admission to the credential program. Directed observation, participation, and teaching in classes for speech correction and lip reading in public schools under supervision. Weekly conference with college supervisor.

165. Methods in Special Education (1-4; max total 4) (Former Ed 165)
Prerequisite: A Ed 105 or Psych 168; teaching experience or permission of instructor. Materials and methods for teaching the learning deviates commonly found in regular classrooms, especially the rapid and slow learners; case studies.

167. Education of the Emotionally Disturbed (2) (Former Ed 167)
Prerequisite: A Ed 105 or Psych 168. Materials and methods for teaching emotionally disturbed children commonly found in regular classrooms; case studies, referral procedures, and working with parents.

172. Laws Relating to Children (2) (Former Ed 164)
May not substitute for A Ed 264. The *Education Code*, *Labor Code*, and *Welfare Code* of the State of California; federal legislation applicable to children.

174. Principles and Techniques in Guidance (3) (Former Ed 174) (Same as Psych 174)
Recommended for both elementary and secondary credential candidates. Prerequisite to all courses in the pupil personnel services credential sequence. Principles, procedures, and techniques in guidance; interrelationships and responsibilities of school personnel; identifying and meeting student needs.

175. Occupational Analysis and Information (2) (Former Ed 155)
Prerequisite: A Ed 174. Theories of occupational choice and their importance for counseling; sources of guidance information; community surveys; job analysis; follow-up studies, work experience programs; placement programs.

176. Child Welfare, Parent Education, and Counseling (2) (Former Ed 180)
Techniques, procedures, and materials for teacher use in facilitating effective home-school relationships.

177. Testing in Counseling (3)
Prerequisite: A Ed 153, 175. Administration and interpretation of commonly used tests in counseling; preparation of case reports.

184. History of Education in the United States (3) (Former Ed 148)

Sources and development of modern American educational theory and practice; understanding and appreciation of educational development and reorganization now in progress.

186. Educational Sociology (2) (Former Ed 152)

Scope and methods of educational sociology; basic sociological concepts; problems involving child, school, and teacher in their cultural settings; social role of schools in a democratic society.

187. Philosophy of Education (2) (Former Ed 172)

Educational significance of present philosophical outlooks; educational, psychological, and sociological implications of major philosophies of education.

188. Issues in Educational Theory (2) (Former Ed 177)

Relation of major philosophical positions to educational trends, issues, and procedures.

190. Independent Study (1-3; max see reference) (Former Ed 190)

(See *Regulations and Procedures–Independent Study.*)

GRADUATE COURSES

(See Course Numbering System–Definitions and Eligibility)

218. Mental Hygiene and Guidance of Children (3) (Former Ed 218) (Same as Psych 218)

Prerequisite: A Ed 105. Seminar on emotional and social problems of children in their adjustments to school and home practices and pressures; critical evaluation of tests, tools, techniques, and procedures in guidance practices for parents and teachers.

220. Research in Education (2) (Former Ed 220) (Same as E Ed-S Ed-PE 220)

Prerequisite: graduate standing and 15 units of education including A Ed 153 or equivalent. Seminar in research methodology; identification of educational research problems; use of library resources, data gathering and processing, writing a research report.

224. Counseling Techniques (3) (Former Ed 224) (See Psych 224)

224F. Field Work in Counseling (2) (Former Ed 224F) (See Psych 224F)

225. Advanced Theories and Techniques in Counseling (3)

Prerequisite: A Ed 175, 224. Advanced study of theories and techniques in counseling; emphasis on application to problems of childhood and adolescence. Case study, interviewing, critique.

226. Organization and Administration of Guidance Services (3) (Former Ed 202)

Prerequisite: completion of 10 or more units in pupil personnel services credential sequence or in master of arts degree program with a concentration in guidance, including A Ed 175, 224. Organization, administration, and evaluation of guidance services.

240. Diagnostic Testing and Remedial Teaching (3) (Former Ed 208)

Prerequisite: A Ed 105, 154. Tools and procedures in diagnostic and remedial programs in arithmetic, reading, language, spelling, handwriting, health, and social studies.

241. Classroom Practice in Diagnostic Testing and Remedial Teaching (3) (Former Ed 210)

Prerequisite: A Ed 240. Work with individual pupils and small groups in diagnosing learning difficulties and providing remedial work.

242. Education and Guidance of the Gifted (3) (Former Ed 212)
Prerequisite: A Ed 105 or equivalent; teaching experience. Nature and needs of the gifted; program planning; field work. (2 lecture hours; 2 field-study hours arranged)

255. Individual Mental Testing (3) (Former Ed 255) (See Psych 265)

261. Organization for Administration and Support of Education (3) (Former Ed 261)
Prerequisite: teaching experience. Interrelationships of federal, state, county, city, and district units in the administration and promotion of programs of education.

262. School Principalship (3) (Former Ed 262)
Prerequisite: teaching experience; A Ed 261 or equivalent. Seminar on problems, procedures, and organizational relationships of elementary and secondary schools; principal's responsibilities in areas of organization and control; teacher personnel, pupil personnel, noncertificated personnel; special and auxiliary agencies; guidance; supervision; community relationships.

263. Supervision for Improvement of Instruction (3) (Former Ed 263)
Prerequisite: teaching experience; E Ed 250 or S Ed 253; A Ed 261; or equivalent. 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. Legal Aspects of Education (3) (Former Ed 264)
Prerequisite: teaching experience; A Ed 261 or equivalent. Legal provisions governing public education, with special attention to the *California Education Code*.

266. School Finance and Business Administration (3) (Former Ed 266)
Prerequisite: A Ed 261 or equivalent. Principles and practices of school finance and business administration; local, state, and federal responsibility for financial support of education.

267. School-Community Relations and School Housing (2) (Former Ed 267)
Prerequisite: A Ed 266 or equivalent. Seminar on instructional aspects of school plants and equipment; planning and utilization; citizens committees; school surveys; school-community relations.

268. Field Work in School Administration (1) (Former Ed 268)
For in-service teachers working toward administration and/or supervision credentials. Prerequisite: admission to the credential program, permission of instructor. On-the-job participation in the solution of problems in administration; written report required. A minimum of three meetings on campus during the semester.

269. Field Work in School Supervision (1) (Former Ed 269)
For in-service teachers working toward administration and/or supervision credentials. Prerequisite: admission to the credential program, permission of instructor. On-the-job participation in the solution of problems in supervision; written report required. A minimum of three meetings on campus during the semester.

270. School Business Administration I (3) (Former Ed 270)
Prerequisite: A Ed 266; 12 units of business administration and accounting or permission of instructor. Theoretical and practical treatment of school budget management; accounts, audits and reports, personnel administration, management of service functions including transportation and cafeterias; relationship of business management to the effectiveness of public education.

271. School Business Administration II (3) (Former Ed 271)

Prerequisite: A Ed 270. Theoretical and practical treatment of school capital outlay and debt service administration; protection and financing of capital outlay programs; bonding and management of bonded debt; management of school plant insurance programs; relationship of school plant to effective education.

275. Advanced Techniques of Personnel Administration in Education (3)

Prerequisite: A Ed 262, 264, 266, Bus Ad 151, or permission of instructor. Advanced techniques of staff improvement in service, 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.

280. Current Problems in Education (3) (Former Ed 283) (Same as E Ed-S Ed 280)

Prerequisite: possession of a regular teaching credential or permission of instructor. Problems of teaching and administration of the public school; recent reports of national professional groups; newly developed research; significant movements in education.

285. Advanced Educational Psychology (3) (Former Ed 285)

Prerequisite: A Ed 105. Seminar on the psychological foundations of education; nature and characteristics of development, learning process, forces which affect educational growth.

286. Advanced Educational Sociology (3) (Former Ed 286)

Prerequisite: A Ed 186; or course in sociology or anthropology and permission of instructor. Seminar for analysis of effect of institutional and ideological trends and problems on the role and operation of the school in American society.

287. History of Educational Thought (3) (Former Ed 287)

Prerequisite: A Ed 187; 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) (Former Ed 290)

See *Regulations and Procedures—Independent Study*.

295. Seminar in Health Education (4) (Former Ed 295)

Prerequisite: completion of 24 units of the master's degree program, including A Ed 220; B average or better; advancement to candidacy for master of arts degree; minimum of 6 units on the Fresno campus. Research methods in solution of problems involving health education; experience in gathering, organizing, interpreting, evaluating, and presenting data; instructor and student evaluation of accomplishments of seminar participants; written report required.

296. Seminar in Administration and Supervision (4) (Former Ed 296)

Prerequisite: completion of 24 units of the master's degree program, including A Ed 220; B average or better; advancement to candidacy for master of arts degree; minimum of 6 units on the Fresno campus. Research methods in solution of educational problems; experience in gathering, organizing, interpreting, evaluating, and presenting data; instructor and student evaluation of accomplishments of seminar participants; leadership and managerial roles of school administrators and supervisors; written report required.

297. Seminar in Counseling and Guidance (4) (Former Ed 297)

Prerequisite: completion of 24 units of the master's degree program, including A Ed 220; B average or better; advancement to candidacy for master of arts degree; minimum of 6 units on Fresno campus. Research methods in solution of problems

involving counseling and guidance; experience in gathering, organizing, interpreting, evaluating, and presenting data; instructor and student evaluation of accomplishments of seminar participants; written report required.

298. Seminar in Teaching Theory and Practice (4) (Former Ed 298) (Same as E Ed-S Ed 298)

Prerequisite: completion of 24 units of the master's degree program including A Ed 220; B average or better; advancement to candidacy for master of arts degree; minimum of 6 units on the Fresno campus. Research methods in solution of problems involving teaching theory and practice; experience in gathering, organizing, interpreting, evaluating and presenting data; instructor and student evaluation of accomplishments of seminar participants; written report required.

299. Thesis (2-4; max total 4) (Former Ed 299)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

HEALTH EDUCATION DEPARTMENT

(In the Education Division)

Professors: Fricker (Chairman), Lindly
Associate Professor: Fikes
Assistant Professor: Kimberly
Part-time: Koontz

MAJOR AND MINOR

A health education major for the bachelor of arts degree consists of 30 units of which 18 are upper division; a minor consists of 18 units of which nine are upper division. One-half of the major or minor requirements must be selected from courses carrying a health education designation. The remaining units may be selected from the courses in the basic biological sciences, family life education, nutrition, and mental health. Consult the department adviser for program planning.

MASTER OF ARTS DEGREE

A special interest area in health education may be incorporated in the master of arts degree in education. For specific requirements consult the department graduate adviser; for general requirements see *Degrees and Credentials—Master's Degrees.*

CREDENTIAL PROGRAMS

For information on the credential programs consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

THE STANDARD DESIGNATED SUBJECTS TEACHING CREDENTIAL WITH SPECIALIZATION IN PUBLIC SAFETY AND ACCIDENT PREVENTION INCLUDING DRIVER EDUCATION AND DRIVER TRAINING

This credential authorizes the holder to teach public safety and accident prevention, including driver education and driver training, at all grade levels and in classes for adults. Candidates for this credential, on the basis of college recommendation, must have a bachelor's degree; a valid California driver's license and satisfactory driving record; admission to the credential program and 12 semester units of approved courses. For further information, consult the department adviser.

THE STANDARD DESIGNATED SERVICES CREDENTIAL WTH SPECIALIZATION IN HEALTH

This credential authorizes the holder to serve as a school nurse or in other designated health services. For specific information, consult department adviser.

Courses

HEALTH EDUCATION

48. First Aid (2)

Standard and advanced Red Cross first aid courses; safety factors in daily living; civil defense programs. Certificates issued when requirements are met.

90. Principles of Healthful Living (2)

Meets general education requirements. Significance of basic health problems applicable to the young adult and to society.

91. Health Information (1)

Meets general education requirements. Not open to students with credit in H Ed 90. A synthesis of scientific knowledge from the contributing disciplines which relate to an understanding of health problems.

105. Safety Education (2)

Prevention of accidents in the home, school, industry, traffic, and community; fire prevention.

110. Alcohol and Narcotics Education (2) Summer only

Problems of alcohol and narcotics education; scientific data on effects of overuse of alcohol and narcotics on adolescents and adults. Teachers, nurses, and social workers develop material appropriate to their work.

123. School Health (3)

Prerequisite: Ed 185. The health program in elementary and secondary schools; administration of eye screening tests.

148. Teaching First Aid (1)

Prerequisite: current standard and advanced Red Cross first aid certificates. Preparation for Red Cross standard and advanced first aid instructor's certificates. Certificates issued when requirements are met.

153. Public Health Nursing (3)

History and development of public health nursing; basic principles and practices; responsibility of public health nurse in community programs, including maternal and child health, disease control and health promotion.

154. School Nursing (3)

Role of the nurse in relation to needs of children and the community; knowledge and understanding of current school health practices.

155. Prevention and Control of Disease (3)

Nature, transmission, prevention and control of communicable and noncommunicable disease from a public health approach; historical background, current problems and trends in disease control.

156. Source Materials (2)

Prerequisite: H Ed 123. Exploration, evaluation, and teaching materials in health.

157. Community Health (2)

Public health services as they affect the community; investigation and analysis of community health problems.

158. Public Health Statistics and Epidemiology (2)

Prerequisite: Bact 54 or H Ed 155, or permission of instructor. Public health statistics and principles of epidemiology; methods of investigating epidemics, collecting of data, analysis and reports.

159. Environmental Sanitation (3)

Prerequisite: H Ed 158 or permission of instructor. Fundamentals of housing, heating, ventilation, lighting, water supply, waste disposal; insect and rodent control; control of milk and other food supplies.

161. Observation or Field Experience in School Nursing (2-8; max total 8)
Prerequisite: full approval for admission to credential programs. Observation or experience in school nursing practices.

163. Public Health Administration (3)
Principles of public health administration; fundamentals of organization and administration in public health.

164. Audiometry (3) (See Sp Corr 164)

165. Directed Group Study in Sanitation (3)
Prerequisite: H Ed 159, permission of instructor. Problems of sanitation and sanitary inspections studied through field trips, observations, demonstrations, and seminars.

170. Driver Education and Training (3) (Same as A Ed 170)
Prerequisite: H Ed 105, senior standing, valid California driver's license. Materials, equipment, and procedures for driver education and training in secondary schools. (2 lecture, 2 lab hours)

190. Independent Study (1-3; max see reference.)
See *Regulations and Procedures—Independent Study.*

GRADUATE COURSES

(See Course Numbering System—Definitions and Eligibility)

205. Safety Education for Teachers (2)
Prerequisite: H Ed 105. Programs, methods, and materials in safety education for elementary and secondary schools.

210. Administration of the School Health Program (3)
Prerequisite: H Ed 123. Organization, administration, and legal aspects of the school health program.

220. Physical Handicaps (2)
Prerequisite: H Ed 123. Cause, treatment, and educational implication of crippling conditions, including cerebral palsy of preschool and school-age children; rehabilitation and adjustment problems.

223. Advanced School Health Education (2)
Prerequisite: H Ed 123; 223F concurrently; teaching experience or permission of instructor. Critical analysis and evaluation of the total school health program; curriculum materials, and special techniques relating to instruction, services, and environment.

223F. Field Work in Advanced School Health (1; max total 2)
Prerequisite or concurrently: H Ed 223. Field experiences in school health; planning, implementation, and evaluation of at least one major area of health.

257. Community Health Education (2)
Prerequisite: H Ed 123, 157; 257F concurrently. Planning educational aspects of community health programs; group procedures; community organization; selection, development, and use of media.

257F. Field Work in Community Health Education (1)

To be taken concurrently with H Ed 257. Field experience in community health education; planning, participation, and evaluation of programs.

280. Problems in Health Education (2)

Prerequisite: permission of instructor. Problems in health education studied through observation of school situations; review of the literature; trends.

302. Selected Topics in Health (1-3; max see below)

May be repeated with different topics. Prerequisite: permission of instructor. Topics in health and safety for teachers, nurses, health personnel, and others.

ENGINEERING DIVISION

Division Head ..... Thomas H. Evans

The Engineering Division provides instruction in the fields of agricultural, civil, electrical and electronics, industrial, and mechanical engineering.

The training includes experience in solving typical problems involving analysis and design. The theoretical studies are supported by laboratory work which demonstrates the theory and also gives the student a familiarity with instruments and equipment with which professional engineers frequently deal.

The course work in engineering requires as a prerequisite a basic knowledge of mathematics and the physical sciences which, together with the general education program, give the student a broad education.

Engineering 154
Agricultural
Civil
Electrical and Electronics
Industrial
Mechanical

ENGINEERING DIVISION

Professors: T. Evans (Head), Barnhart, Cehrs, J. H. Smith
Associate Professors: Foin, Kulhan
Assistant Professors: Bevill, Deming, Gaylord, Higgins, Jarrett, Lawton, Lowe, Richards

The Engineering Division offers bachelor of science degree majors in agricultural, civil, electrical and electronics, industrial, and mechanical engineering. Students are prepared for professional engineering and graduate study. A substantial amount of science and mathematics is required in the undergraduate program in order that the student understand thoroughly the science he must apply as a professional engineer. The program is science oriented, but only for the purpose of providing the understanding necessary for engineering analysis and creative design. Projects in engineering design that integrate and apply previous fundamental knowledge are assigned in the senior year.

The undergraduate program for the degree is organized to meet accrediting requirements by containing approximately one-fourth of the program in each of the following areas: basic science and mathematics; engineering science (such as mechanics of solids and fluids, materials, thermodynamics, electricity and magnetism); analysis, design, and support subjects in a professional major (such as civil, electrical, or mechanical); humanities, social sciences, electives and auxiliary subjects.

HIGH SCHOOL PREPARATION

Minimum high school preparation for entering the engineering program consists of the following: English (3 years), algebra (2 years), geometry (1 year), advanced mathematics (or trigonometry or elementary functions) (½ year), physics or chemistry (1 year). Deficiencies in the minimum high school requirements can be made up at the college in regular or summer sessions, but may extend the program beyond the normal four years.

Additional recommended high school courses include: advanced mathematics (½ year), physics or chemistry (1 year), biology (1 year), foreign language (2 years), history (1 year), mechanical drawing (½ year), shop (½ year).

TRANSFERS

Transfers from junior colleges or other institutions of higher learning are accepted under provisions outlined under *Regulations and Procedures—Admissions*. Students planning to transfer to the Fresno State College engineering program should follow as closely as possible the programs outlined below. Significant deviation from the program in mathematics, science, and engineering courses may necessitate more than the normal four years to complete the engineering degree requirements.

ENGINEERING FIELDS

Agricultural Engineering. Agricultural engineering utilizes basic fundamentals of engineering and agriculture in economic applications of scientific knowledge to agricultural production and processing; specifically, to the development of machinery, structures, equipment, practices, techniques, methods, and fundamentals. Agricultural engineering prepares for positions in the equipment industry in the areas of design, research, development, testing, sales and management; in the irrigation and drainage field for both public and private organizations, in the areas of design, field investigation, project planning, operation, maintenance, construction supervision and management.

Civil Engineering. Among the many areas included in civil engineering are design and construction of bridges, buildings, dams, waterways, railroads, airport terminals, pipelines, highways, water supply and sanitary systems, foundations, hydroelectric installations, irrigation, and many other systems and structures of modern civilization. Also included are design and structure of airplanes and missiles and the field of surveying and mapping.

Electrical and Electronics Engineering. Electrical engineering's many specialties are grouped under the two main areas of power and electronics. Power engineering involves the generation, distribution, and utilization of electricity to provide power, heat, and light, and the use of various electronic devices in the process. Electronics engineering involves electrical communications, including electron devices for transmission and reception over wires or through space; devices which control or aid industrial processes, medical science, guidance and detection of air and spacecraft; and exceedingly high-speed electronic computing machines.

Industrial Engineering. Industrial engineering is the field of engineering developed to consider the economic and human, as well as technical, aspects of engineering endeavor, especially in the area of industrial production activities. This field of engineering has application in all types of industry and in areas requiring efficient use of manpower, machines, materials, and money.

Mechanical Engineering. Mechanical engineering is the branch of engineering involving generation, transmission, and utilization of thermal, nuclear, or mechanical energy, including refrigeration and air conditioning. It deals with engineering problems involving machinery and systems, their control and products, and involves research, design, production, operational, organizational, and economic aspects of the field.

CREDENTIAL PROGRAM

For information on credential programs, consult departmental advisers and see *Public School Credentials* and the *Education Division*.

BACHELOR OF SCIENCE DEGREE IN ENGINEERING

The bachelor of science degree in a specific engineering major is granted upon completion of 136 units specified in the major and general degree requirements. See requirements listed below and under *Degrees and Credentials*. General education requirements throughout the program may be taken in any order approved by the adviser. Following the sequences listed below requires 17 units per semester.

First and Second Year Programs Required of All Engineering Majors

1st Year: 1st Semester: Engr 26, Math 3, Chem 1A, PE or AFROTC, Arts
2nd Semester: Math 4, Chem 8, Physics 4A, English 1, H Ed 91, PE or AFROTC

2nd Year: 3rd Semester: Math 6, Physics 4B, Speech, Hist 10, Engr 30, 70, PE or AFROTC
4th Semester: Math 117, Physics 4C, Pol Sc 11, Arts (0-1 un), PE or AFROTC, Engr 32; for CE and AgE (Engr 1, 1L), for ME and IE (Engr 11, 11L), for EE (Engr 150, 150L)

Third and Fourth Year Programs for Specific Majors

Agricultural Engineering (AgE)

3rd Year: 5th Semester: Engr 130, 131, 131L, 164, 164L, Ag 136, AH 1
6th Semester: Engr 11, 11L, 121, 165, 165L, AgM 115A, Bot 1

4th Year: 7th Semester: AgM 159, Psych 10, Engr 150, 150L; social science; approved electives
8th Semester: Engr 151, 151L, 170, AgM 81, literature or philosophy; approved elective; elective
(Approved electives from: Ag 146, AgM 115B, 151A-B, 158, Geology)

Civil Engineering (CE)

3rd Year: 5th Semester: Engr 2, 2L, 130, 131, 131L, 164, 164L, Psych 10
6th Semester: Engr 135, 137, 138, 165, 165L, literature or philosophy; approved electives

4th Year: 7th Semester: Engr 134, 143, 150, 150L, 170; social science; approved electives
8th Semester: Engr 133, 142, 151, 151L or 156, 156L; 172; biological science; elective
(Approved electives from: Engr 101, 102, 103, 104, 139, 141, 171, Geology)

Electrical and Electronics Engineering (EE)

3rd Year: 5th Semester: Engr 130, 131, 152, 152L, 155, 155L, 156, 156L
6th Semester: Engr 131L, 151, 151L, 153, 153L, 157, 157L, 164, 164L

4th Year: 7th Semester: Engr 165, 165L, biological science, literature or philosophy; approved elective; elective
8th Semester: Engr 170, 172, Psych 10, history, arts; approved elective; elective
(Approved electives from: Engr 158, 158L, 171, 180, 180L)

Industrial Engineering (IE)

3rd Year: 5th Semester: Engr 130, 131, 131L, 164, 164L, Bus Ad 124, Econ 1A
6th Semester: Engr 110, 121, 150, 150L, 165, 165L, Econ 1B

4th Year: 7th Semester: Engr 111, 151, 151L, 170, Acct 1A, Psych 10; approved elective
8th Semester: Engr 156, 156L, 172, biological science, literature or philosophy, social science; approved elective
(Approved electives from: Acct 1B, Bus Ad 151, 161, Engr 122, 139, 171, Math 130 or 131)

Mechanical Engineering (ME)

3rd Year: 5th Semester: Engr 130, 131, 150, 150L, 164, 164L, Psych 10
6th Semester: Engr 121, 139, 151, 151L, 165, 165L, literature or philosophy

4th Year: 7th Semester: Engr 122, 131L, 156, 156L, 166, 166L, social science; approved elective
8th Semester: Engr 136, 170, 172, biological science; approved elective; elective
(Approved electives from: Engr 123, 124, 162, 162L, 171)

Courses

ENGINEERING

Note: Associated lecture and laboratory courses must be taken concurrently except as indicated in course sequences.

1. Plane Surveying: Elementary (2)

Prerequisite: Math B, C, one year of mechanical drawing, or permission of instructor. Familiarization with surveying instruments; calculations; topographic surveying.

1L. Plane Surveying: Elementary Laboratory (1)

Field practice in measurements of distance, and in use of level, transit, and plane table in solution of practical problems. (3 lab hours; field trips)

2. Plane Surveying: Advanced (2)

Prerequisite: Engr 1, 1L. Theory and computations covering land surveying; engineering astronomy; introduction to route surveying.

2L. Plane Surveying: Advanced Laboratory (1)

Field practice in land surveying, astronomy, triangulation, and route layout. (3 lab hours; field trips)

11. Manufacturing Processes (2)

General purpose and production machine tools, metal cutting and welding, hot and cold forming, grinding, gages, jigs, fixtures, tooling.

11L. Manufacturing Processes Laboratory (1)

Operation of machine tools, welding equipment, hot and cold forming equipment, casting equipment; practice in the use of gages, jigs, and fixtures. (3 lab hours; field trips)

26. Engineering Graphics (4)

Prerequisite: Math 3 (or concurrently). Principles and applications of orthographic projection and graphical mathematics to the solution of engineering problems. (2 lecture, 2 3-hour labs)

30. Engineering Mechanics: Statics (2)

Prerequisite: Physics 4A; Math 6 (or concurrently). Statics, analysis of force systems, equilibrium problems, graphic and algebraic methods of problem solution.

32. Engineering Materials (2)

Prerequisite: Engr 30; Chem 8 (or concurrently). Fundamental nature and properties of engineering materials; structure of matter; mechanical, electrical, magnetic, and thermal properties.

70. Computer Programming (1)

Prerequisite: Math 3, 4. Introduction to digital computer programming. (1 2-hour lecture-lab)

101. Route Surveying (2)

Prerequisite: Engr 2, 2L. Computation and field work covering surveys for highway, irrigation, construction and other kinds of engineering projects. (1 lecture, 3 lab hours; field trips)

102. Geodetic Surveying (2)

Prerequisite: Engr 2, 2L; Math 6. Triangulation; adjustment of geodetic figures; base line measurement, map projection; precise leveling. (1 lecture, 3 lab hours; field trips)

103. Photogrammetry (2)

Prerequisite: Math C, Engr 1, or permission of instructor. Terrestrial and aerial photography applied to surveying and mapping; stereoscopy; application of aerial surveying to specific engineering problems. (1 lecture, 3 lab hours; field trips)

104. Boundary Control and Legal Principles (2)

Prerequisite: Engr 2. Legal principles that control the boundary location of real property.

110. Statistical Analysis and Control (3)

Prerequisite: Math 4. Fundamentals of probability and statistics; general theory and practice of statistical quality control applied to industrial situations; sampling plans.

111. Methods Analysis (2)

Prerequisite: Senior standing or permission of instructor. General approach to a design problem; application of the design approach to methods engineering; principles of motion economy; descriptive techniques useful to the methods designer; work measurement; work sampling; special problems in methods engineering. (2 2-hour lecture-labs)

121. Mechanism (3)

Prerequisite: Engr 26, 70, 130. Analytical and graphical solutions of motion problems involving mechanical elements; synthesis of plane and space linkage systems. (2 3-hour lecture-labs)

122. Machine Design (3)

Prerequisite: Engr 70; 130; 139 (or concurrently); Math 117. Analytical study of machinery; applications to design of machines; use of computers in design problems.

123. Advanced Mechanical Design (2)

Prerequisite: Engr 70, 121, 122; Math 117. Analytical study of dynamics of machinery; applications to design problems. (2 2-hour lecture-labs)

124. Vibration (3)

Prerequisite: Engr 70, 130; Math 117. Mathematical and physical basis of vibration theory with applications to engineering; transient and steady state phenomena; distributed and lumped parameters; coupled systems; computer solutions.

130. Engineering Mechanics: Dynamics (3)

Prerequisite: Engr 30. Application of principles of kinematics and kinetics to problems in engineering.

131. Mechanics of Materials (3)

Prerequisite: Engr 30; 32 (or concurrently). Application of principles of mechanics to find stresses and deformations in machine and structural members.

131L. Mechanics of Materials Laboratory (1) (Former Engr 132)

Prerequisite: Engr 32; 131 (or concurrently). Application of the principles and methods of testing to verify theory and determine limitations of principles of mechanics of materials.

133. Steel and Timber Structures (3)

Prerequisite: Engr 135. Steel and timber members for buildings and bridges designed for dead, live, impact, wind, and seismic forces; light gage and plastic steel design. (2 lecture, 3 lab hours)

134. Reinforced Concrete (3)

Prerequisite: Engr 135. Design and investigation of concrete structures by elastic and ultimate design procedures; prestressed concrete. (2 lecture, 3 lab hours)

135. Theory of Structures (3)

Prerequisite: Engr 131. Trusses and frames analyzed by algebraic and graphic procedures; influence lines and Cooper diagrams; rigid frames analyzed by slope deflection and moment distribution.

136. Physical Metallurgy (2)

Prerequisite: Engr 131L. Physical properties of metals as manufactured and affected by heat-treatment and forming processes; correlation of properties with microstructure. (1 lecture, 3 lab hours)

137. Soil Mechanics (3)

Prerequisite: Engr 131L. Physical and mechanical properties of soil as an engineering material; theoretical studies in permeability, compressibility and compression and stress-deformation and strength characteristics. (2 lecture, 3 lab hours; field trips)

138. Highway Engineering (2)

Prerequisite: Engr 2; 137 (or concurrently). Feasibility and economic considerations in location, design, construction, and maintenance of streets and highways.

139. Advanced Mechanics of Materials (3)

Prerequisite: Engr 70, 131; Math 117. Advanced topics in mechanics of materials.

141. Irrigation Engineering (2)

Prerequisite: Engr 131, 164. Flow of water in canals, design of canals and canal systems, measurements of water, surveys for irrigation systems. (1 lecture, 3 lab hours; field trips)

142. Water Supply and Sanitation (2)

Prerequisite: Engr 164. Water treatment plants, distribution systems, waste collection systems and disposal facilities; storm drainage systems. (2 lecture; field trips)

143. Concrete Laboratory (1)

Prerequisite: Engr 131L; 134 (or concurrently). Proportioning of concrete mixes; admixtures; test for entrained air; slump test; compressive and flexural strength tests; reinforced concrete. (3 lab hours; field trip)

150. Magnetic and Electric Circuits (3)

Prerequisite: Physics 4B, Math 6 (or concurrently). Fundamentals of magnetic circuits; basic laws of direct-current and of single and polyphase alternating-current circuits; transient phenomena in simple circuits; principles of electrical instruments.

150L. Magnetic and Electric Circuits Laboratory (1)

Use of electrical instruments; experiments and computations on magnetic, direct- and alternating-current circuits, single and polyphase, and on transient phenomena in simple circuits. (3 lab hours)

151. Electrical Machinery (3)

Prerequisite: Engr 150, 150L. Principles of direct- and alternating-current machinery and of other energy-conversion devices and associated apparatus.

151L. Electrical Machinery Laboratory (1)

Experiments and computations on direct- and alternating-current machinery and on other energy-conversion devices and associated apparatus. (3 lab hours)

152. Electrical Circuit Analysis (3)
Prerequisite: Engr 150, 150L; Math 117. Complex circuits, locus diagrams, network theorems, coupled circuits, nonlinear circuit elements, non-sinusoidal waves, pulses, transients, unbalanced three-phase circuits, symmetrical components, synthesis and design of circuits; applications of matrix algebra, Fourier series and integral, Laplace transforms.

152L. Electrical Circuit Analysis Laboratory (1)
Experiments and computations on networks, bridge circuits, coupled circuits, non-sinusoidal waves, pulses, transients, unbalanced three-phase circuits, and symmetrical components; experimental data analyzed according to modern data-analysis techniques. (3 lab hours; field trips)

153. Electrical Transmission (3)
Prerequisite: Engr 152, 152L, 155, 155L. Principles of transmission of electrical energy over wires at power and communication frequencies and through wave guides and space at ultra-high frequencies; filter circuits; design of transmission systems.

153L. Electrical Transmission Laboratory (1)
Experiments involving electrical transmission of energy, including filter circuits. (3 lab hours; field trips)

155. Electric and Magnetic Fields (3)
Prerequisite: Engr 152, 152L (or concurrently). Advanced topics in electricity and magnetism; fields and waves; emphasis on applications to engineering.

155L. Electric and Magnetic Fields Laboratory (1)
Advanced experiments in electricity, magnetism, and in electromagnetic fields and waves. (3 lab hours)

156. Electronics (2)
Prerequisite: Engr 150, 150L. Electron tube and semiconductor electronics; introduction to basic systems; engineering applications and considerations.

156L. Electronics Laboratory (1)
Laboratory experiments in electronics; engineering applications. (3 lab hours)

157. Electronic Devices and Circuits (3)
Prerequisite: Engr 156, 156L. Physical electronics, characteristics and properties of electronic devices, both thermionic and solid state; theory of electronic circuits; analysis of linear feedback systems.

157L. Electronic Devices and Circuits Laboratory (1)
Experimental studies of electronic devices, circuits, and commercial type apparatus. (3 lab hours; fields trips)

158. Electronic Systems and Controls (3)
Prerequisite: Engr 153, 153L, 157, 157L. Applications of electronic circuits to engineering systems including communication, control, computer, television, telemetry radar, and microwaves systems; high-frequency techniques; special applications, and design considerations.

158L. Electronic Systems and Controls Laboratory (1)
Electronic measurements; laboratory studies of electronic systems. (3 lab hours; field trips)

162. Air Conditioning (3)

Prerequisite: Engr 166, 166L (or concurrently). Theory and practice in air conditioning including psychrometrics, load estimating, heating and cooling systems, fluid design and controls.

162L. Air Conditioning Laboratory (1)

Practical laboratory work with commercial type units; test of components of air conditioning systems. (3 lab hours; field trips)

164. Thermodynamics-Fluid Mechanics A (3)

Not open to students with credit in Engr 140, 140L; 160, 160L; 161, 161L; or 163, 163L. Prerequisite: Engr 130 (or concurrently), Physics 4C. Fundamentals of thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

164L. Thermodynamics-Fluid Mechanics Laboratory A (1)

Prerequisite: Engr 164 (or concurrently). Application to thermo-fluid systems of experimental methods used in engineering practice.

165. Thermodynamics-Fluid Mechanics B (3)

Prerequisite: Engr 164. Continuation of Engr 164. Fundamentals of thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

165L. Thermodynamics-Fluid Mechanics Laboratory B (1)

Prerequisite: Engr 164L, 165 (or concurrently). Application to thermo-fluid systems of experimental methods used in engineering practice.

166. Advanced Thermodynamics-Fluid Mechanics (3)

Prerequisite: Engr 165. Advanced topics in thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

166L. Advanced Thermodynamics-Fluid Mechanics Laboratory (1)

Prerequisite: Engr 165L, 166 (or concurrently). Application to thermo-fluid systems of advanced experimental methods used in engineering practice.

170. Engineering Economy (2)

Prerequisite: senior standing in engineering. Importance of economic analyses 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.

171. 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.

172. Senior Project (2)

Prerequisite: senior standing in engineering. Study of a problem by student under supervision of a staff member; final written report to the engineering staff. (Individual project except by special permission)

180. Electrical Power Systems (3)

Prerequisite: Engr 151, 151L, 153, 153L, 156, 156L. Electrical power equipment and systems, operation and design, commercial practice and regulations; high voltage, lightning and surge phenomena; control and protection schemes; fault and stability calculations; introduction to nuclear power engineering.

180L. Electrical Power Systems Laboratory (1)

Experiments and computations on high-voltage and electrical power equipment and systems and associated apparatus; electrical design of power systems, commercial practice. (3 lab hours; field trips)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures–Independent Study*.

GRADUATE COURSES

(See *Course Numbering System–Definitions and Eligibility*)

311. Professional Examination Review (2; max see below)

May be repeated for credit provided different fields are covered. 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 (3; max see below)

May be repeated for credit provided different fields are covered. Prerequisite: bachelor's degree in engineering 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.

FINE ARTS DIVISION

Division Head ..... Ralph C. Rea

Department	*Chairman*
Art	John Ed Herbert
Music	Ralph C. Rea

The Fine Arts Division includes the departments of art and music whose curricula admit students as majors or minors for the bachelor of arts degree; professional, semiprofessional, and teaching careers; and the master of arts degree in music and art.

The scope and variety of offerings in the division provide excellent opportunity for general education to prepare students for fuller cultural living and appreciation of the arts.

Art 164
Music 169

ART DEPARTMENT

(In the Fine Arts Division)

Professor: Herbert (Chairman)
Associate Professors: Musselman, A. Odorfer (p-t)
Assistant Professors: Aiken, Laury, Maughelli, Minschew, S. Williams, W. Williams
Instructor: Smalley
Part-time: Henry, Kasai, Willett

The Art Department offers a major in art which leads to a bachelor's degree and a program for the master's degree. A degree of specialization is possible for people who plan professions or avocations as teachers, painters, decorators, advertising and display artists, illustrators, photographers, ceramists, and industrial designers. Students may choose, with guidance, areas of experience to satisfy their special needs.

For art courses fulfilling general education requirements see *Degrees and Credentials.*

MAJOR

The major in art consists of 39 units in required courses, of which 24 must be upper division.

	Units
Art 2, 3 (taken concurrently); 9, 11, 14, 18A, 50	15
Art 118A, 119 (6 units), 131 or 132, 133 (mixed media only), 144, 150	17
Approved electives in art (ud)	7
	39

MINOR

The minor in art consists of 21 units in required courses as listed.

	Units
Art 2, 3 (taken concurrently); 9, 11, 14, 50	13
Art 119	3
Approved electives in art (ud)	5
	21

CREDENTIAL PROGRAM

For information on the credential program consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in art must include, within the 30 units required for the degree, at least 14 units in art. For specific requirements consult the department chairman; for general requirements see *Degrees and Credentials—Master's Degree.*

Courses

ART

2. Man and Expression (2)

Taken concurrently with Art 3. Required of all art majors and minors. Artistic behavior related to innovation, creative problem solving, concepts of design, and cultural influences on the artist.

3. Color and Design (3)

Open to general education students. Relationships of materials, media, expression and ideas and their effects on contemporary art. (3 2-hour lecture-labs; field trips)

4. Contemporary Influences in Art (2)

Open to general education students. Function and character of art as an integral force in contemporary society; critical appreciation of aesthetic factors and contemporary trends in painting, sculpture, graphic arts, architecture, design for mass production, and arts of individual craftsmen.

7. Perspective (1)

Scheduled first eight weeks of semester. Theory and practice of representing three-dimensional objects on a two-dimensional surface with both one- and two-point perspective; problems in fields of architecture, interior decoration, fine and commercial art.

8. Costume Design (3)

Prerequisite: Art 3. Individual types, colors, proper line, choice and planning costumes; history of costume for appreciation, source of ideas for modern design; costumes for the stage and dance; fashion illustrating and advertising. (3 2-hour lecture-labs)

9. Lettering and Layout (2)

Not open to students with 2 units credit in Art 7. Technical facility and appreciation of lettering and layout in the design of posters, books, periodicals, and advertisements. (2 2-hour lecture-labs)

11. Pottery (2)

Elementary building processes and surface treatments; firing, development and use of design criteria; history and appreciation of pottery.

14. Drawing and Composition (2)

Intensive study of drawing techniques in relation to the varied objectives of artists. (2 2-hour lecture-labs)

18A-B. Figure Drawing (2-2)

Drawing from the model. (2 2-hour lecture-labs)

40. Visual Presentation and Display Concepts (1)

Prerequisite: sophomore standing. Current problems of effectively displaying all types of two- and three-dimensional material in the gallery and classroom; installing exhibits in the Art Department gallery.

45. Appreciation of Interior Design (1)

Appreciation and understanding of design in home planning and replanning for contemporary and period style. Lectures, demonstrations, field trips.

50. Sculpture (2)

Producing sculpture for a variety of uses; creative experimentation with materials and processes; design quality. (2 2-hour lecture-labs)

55A-B. Print Making (2-2)

Prerequisite: Art 3 or permission of instructor. (A) Exploration of various media in print making; present and past examples. (B) Concentrated study of one or more areas in print making. (2 2-hour lecture-labs)

100A-B. Art for Teachers in Service (1-1) Summer only

Drawing, painting, and crafts for children; adjusted to needs of students enrolled.

101. Photography (2)

Not open to students with credit in Jour 17A. Outdoor and indoor photography; developing films and prints; composition and creative approach. Camera equipment provided. (1 lecture, 3 lab hours)

103. Art Education for the Elementary School (2)

Prerequisite: Art 135 or equivalent. Development of creative attitudes and philosophy of teaching art; research in the development of creative thinking as applied to art education; understanding children's creative expression; guiding children in art situations; art activities in all grades of elementary school.

104. Art Education for the Secondary School (3)

Development of creative attitudes and philosophy of teaching art; research in the development of creative thinking and its implication for art education at the secondary level; current problems, adolescent and teenage art expressions, curriculum planning, observations, laboratory.

108. Advanced Costume Design (2)

Prerequisite: Art 8. Designing advanced seasonal styles; sketching from draped material; fashion illustration; construction from original designs; historic costume; leaders in fashion field. (2 2-hour lecture-labs)

110. Pottery (2) (Former Art 111A)

Prerequisite: Art 11. Glaze calculation and experimentation; advanced work in pottery design and construction; use of the potter's wheel. (2 2-hour lecture-labs)

111. Ceramic Sculpture (2) (Former Art 111B)

Prerequisite: permission of instructor. Construction and firing of clay sculpture; appreciation of three-dimensional design. (2 2-hour lecture-labs)

112. Composition and Design (2)

Prerequisite: Art 3. Advanced problems in textile design and screen printing with dyes; three-dimensional design in advertising, exhibits. (2 2-hour lecture-labs)

114. Drawing and Painting: Oil (3)

Prerequisite: Art 3. Selecting, arranging and composing still life material; picture building in both traditional and contemporary methods; use of color and variety of techniques; head and figure painting. (3 2-hour lecture-labs)

115. Illustration (3; max total 6, for credential 3)

Prerequisite: Art 3, Art 18A-B or 118A-B-C-D. Advanced advertising and illustration; problems from rough layouts to finished renderings for all phases of commercial art, book and magazine illustration; methods of reproduction and printing. (3 2-hour lecture-labs)

116. Water Color Painting and Composition (3)

Prerequisite: Art 3. Exploration of contemporary water-color techniques; approaches to picture building with still life, flowers, figures and other indoor material. (3 2-hour lecture-labs)

118A-B-C-D. Life Drawing (2-2-2-2)

Figure composition and drawing from nude and costumed figures; charcoal, ink, and paint. (2 2-hour lecture-labs)

119. Art Appreciation and History (3; max total 9 if no era repeated)

Prehistoric to the 12th century; 12th century to present; 19th and 20th century.

121. Color Photography (2)
Prerequisite: Art 101 or equivalent. Exposing and processing color slides, making color prints by the negative-positive system; color theory, harmonious color combinations. (2 2-hour lecture-labs)

131. Outdoor Painting: Oil (2) (Former Art 131A)
Prerequisite: Art 114. Landscape composition and painting from local motifs on location and in the studio; various approaches and techniques. (2 3-hour lecture-labs)

132. Outdoor Painting: Water Color (2) (Former Art 131B)
Prerequisite: Art 116. Similar to Art 131 (2 3-hour lecture-labs)

133. Advanced Painting and Composition (3; max total 9 if no media repeated)
Prerequisite: Art 114 or 116 or equivalent. Studio instruction in painting and composition: oil, water color opaque, mixed media.

135. Arts and Crafts in the Elementary School (3)
Not open to students with credit in Art 5 and 130. Recommended: E Ed 105. Creative and mental development of children in relation to school, home, and community; exploring art materials, significance to children; observation, laboratory work with children. (3 2-hour lecture-labs)

141. Motion Picture Photography (2)
Use of amateur motion picture equipment for production of simple instructional and experimental films in black and white and color; planning, lighting, exposing, editing, titling, and synchronizing sound. (2 2-hour lecture labs)

144. Crafts (2; max total 4 if different problem areas) (Former Art 144A-B)
Prerequisite: Art 3. Individual problems in contemporary crafts; design of utilitarian products; contemporary designer-craftsmen; basic experiences in wood, fabrics, paper, plastics, metals, glass, and experimental processes.

145A-B. Interior Design (3-3)
Prerequisite: Art 3. Recommended: Art 7. (A) Contemporary interior; designing, selecting and arranging furniture, color and texture, to create a functional and congenial atmosphere for modern living; period furniture styles in relation to present trends. (B) Advanced design problems in decoration of rooms for restaurants, offices and stores; decoration of rooms in home and school social rooms. (3 2-hour lecture-labs)

150. Sculpture (2)
Prerequisite: Art 50 or permission of instructor. Structural and aesthetic considerations of sculpture as a contemporary art form. Studio fees. (2 2-hour lecture-labs)

180. Design in the Theatre (3) (See Drama 180)

190. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

220. Research Techniques in Art (2)
Prerequisite: minor in art. Seminar in research procedures: location and evaluation of research materials; application to a current problem or sample experience; selection, limitation, and statement of topic; outline of research.

225. Seminar in Art Education (2; max total 4)

Prerequisite or concurrently: Art 220. Psychology and philosophy in art education; recent developments in the field.

229. Problems in Art Materials and Processes (2)

Exploration and experimentation with a variety of art media, materials, and processes suitable for secondary school art teaching. Lectures, laboratory, and field work in public schools.

240. Seminar in Plastic Arts (2; max total 6)

Prerequisite: permission of instructor. Relationships of two- and three-dimensional expression in space, form, and function; attitudes, techniques, and skills of the artist. Research and laboratory experiences in a wide variety of media.

260. Seminar in Art History (2; max total 6)

Prerequisite: six units of Art 119 or equivalent. Critical analysis of selected works from movements in architecture and area planning; painting; graphic arts; sculpture; art in industry; art in commerce; art in the home. Individual topics of study selected with approval of instructor.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis or Project (2-4; max total 4)

Prerequisite: Art 220; see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

MUSIC DEPARTMENT

(In the Fine Arts Division)

Professors: R. Rea (Chairman), Berdahl, A. Bryon, Delaney, Howland, J. Winter, Withrow
Associate Professors: Baddin, Dempster
Assistant Professors: Bakkegard, Barnes, Bennett, Ehlers, Irwin, J. H. Martin
Part-time: Kostiw, Vermel

The Music Department offers the following curricula leading to the bachelor of arts degree with a major or a minor in music, with or without a teaching credential. In addition to curricula designed to prepare the student for a professional career in the performance or teaching of music, courses are offered to satisfy general education requirements and avocational objectives for the non-music major.

The department also offers courses leading to the master of arts degree with music education, composition, history and literature, or performance as major areas of concentration.

Students should consult with the department chairman before registering for the major in music.

SPECIAL MUSIC REQUIREMENTS

1. Music majors are required, with the approval of the department chairman, to declare a major area of performance and to perform a satisfactory senior recital before being approved for graduation. (See Mus 10 for applied music areas)
2. Music majors are required to participate in a music laboratory each semester. Voice majors will satisfy this requirement by enrolling in a cappella choir; string majors by enrolling in orchestra; brass, woodwind, and percussion majors by enrolling in band; others by enrolling in one of the instrumental or choral organizations named above.
3. Students enrolled in music laboratories in the fall semester are expected to re-enroll for the spring semester. The nature of the work in music organizations (band, orchestra, chorus, etc.) makes it essential that constant personnel be maintained throughout the year.
4. Music majors are expected to attend all departmental concerts and recitals.
5. All students enrolled in applied music courses must attend the monthly departmental student recitals.
6. Music majors enrolled in intermediate or advanced applied music classes and all students enrolled in advanced applied music courses are expected to appear in student recitals.
7. Music majors should include Physics 55 in the general education program.

BACHELOR OF ARTS DEGREE

Each student desiring a bachelor of arts degree with a major or minor in music must fulfill all the requirements listed under *General Degree Regulations* and *General Education*, and complete one of the curricula listed below.

MUSIC MAJOR

The major in music for the bachelor of arts degree requires the completion of the following basic music requirements, one field of concentration, participation in one of the laboratory organizations each semester (see *Special Music Requirements*), and a satisfactory senior recital.

Basic Music Requirements	*Units*
Music 4A-B, 14A-B, 111B, 114A-B, 116	23
Music 110 (major instrument or voice, at least 4 units in advanced class)	8
Senior recital	x
Fields of Concentration (Complete one)	5–6

Elementary Music Education (5 units)
Music 129 or 136; 139
Piano and voice tests or instrumental techniques test

Secondary Music Education (5-6 units)
Music 111A or 136; 189
Piano and voice tests or instrumental techniques test

Performance (5 units)
Music 111A; elect 2 units from Music 104, 124, 134, 136, 154A-B

36-37

MUSIC MINOR

The minor in music requires the completion of at least 20 units approved by the department chairman. Fields of concentration in choral or instrumental music are offered.

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in music is based upon the equivalent of the undergraduate major in music at Fresno State College. Of the 30 units required for the degree, 18 must be in music. For specific requirements, consult the chairman of the department; for general requirements, see *Degrees and Credentials—Master's Degrees*.

Courses

MUSIC

1. Music Laboratory (1-2; max see below) (Same as Mus 101)

Maximum total credit 12 units, not more than 8 of which can be in any one activity. Freshmen and sophomores (fewer than 60 units) register for Mus 1; others (more than 60 units) register for Mus 101. May apply on general education requirement in the arts for non-music majors. Group performance of music literature for interpretative and creative experience. (See *Special Music Requirements*, 2 and 3)

A cappella choir, college chorus, male chorus, women's chorus, orchestra, band, dance band, AFROTC band, band workshop, opera workshop, chamber music ensembles, small vocal ensembles (single and double duets, trios, quartets, quintets, sextets, octets), small instrumental ensembles (brass and woodwind choirs, string and mixed ensembles).

4A-B. Fundamentals of Music (3-3)

Fundamentals of musical theory; ear training and sight singing. (5 lecture-lab hours)

9. Music Fundamentals for Elementary Teachers (3)

Recommended for elementary credential students. Basic skills and fundamentals for teaching music in the elementary school; piano keyboard; writing and reading music; singing unison and part songs; playing simple melodic and rhythmic instruments; listening to recorded music.

10. Class Instruction in Applied Music (2; max total 8 each area) (Same as Mus 110)

Freshmen and sophomores (fewer than 60 units) register for Mus 10; others (more than 60 units) register for 110. Instruction according to level of student performance ability. (See *Special Music Requirements*, 5 and 6) Applied music areas: flute, oboe, clarinet, bassoon, saxophone, French horn, trumpet, trombone, baritone, tuba, percussion, violin, viola, cello, bass, organ, piano, voice, harp. (Special fee for organ)

11A-B. Music Appreciation (2-2)

Open only to music majors and minors except by permission of instructor; may apply on general education requirement in the arts for non-music majors. Music from the late fifteenth century to the present; directed listening; explanations and analysis.

14A-B. Harmony (3-3)

Prerequisite: Mus 4A-B or equivalent. Fundamentals of harmony; diatonic and simple chromatic harmony of the eighteenth and early nineteenth centuries.

76. Listeners' Guide to Music (2)

For students untrained in music; may not count on music major except by special arrangement. May apply on general education requirement in the arts for non-music majors. Practical approach to hearing music with understanding and pleasure.

101. Music Laboratory (1-2) (See Mus 1)

104. Counterpoint (2)

Prerequisite: Mus 14A-B. Modal polyphony of the late sixteenth century; analysis; composition of single lines, simple counterpoint, all types of imitation; writing of three-voice motets with text.

106. Basic Instrumental Techniques for Teachers (2; max total 8)
Basic techniques for teaching instrumental music in public schools; procedures, methods and materials for conducting beginning instrument classes in woodwinds, brass, percussion, violin-viola-cello-bass. See *Special Music Requirements*, 7. (3 lecture-lab hours)

110. Class Instruction in Applied Music (2; max total 8 each area) (See Mus 10)

111A-B. History of Music (3-3)
Chronological survey and analysis of the development of music.

114A-B. Advanced Theory (3-3)
Prerequisite: Mus 14A-B. Analysis and application of traditional and contemporary harmonic practices.

116. Conducting (2)
Candidates for teaching credentials should take this course prior to student teaching. Instrumental and choral conducting; essential personal traits and baton techniques. Individual participation; supplementary reading with observation of successful conductors.

119. Classroom Music for Elementary Teachers (2; max total 4)
Prerequisite: Mus 9 or equivalent. Workshop approach to acquaint the classroom teacher with state text materials; methods of developing a varied program of singing, rhythmic, instrumental, listening, and creative activities within the classroom.

121A-B. Survey of Music Literature (2-2)
May apply on general education requirement in the arts for non-music majors. Introduction to musical styles, periods, and important composers for historical perspective through listening to music.

124. Form and Analysis (2)
Prerequisite: Mus 14A-B. Analysis of the principal music forms.

128. Accompanying (1; max total 4)
Prerequisite: advanced standing in piano; permission of instructor. Accompanying under supervision.

129. Elementary School Music Activities (2)
Recommended for elementary credentials and students with limited music experience. Prerequisite: Mus 9 or 4A. Singing, rhythmic, instrumental, listening, and creative activities, using state textbooks and supplementary materials. Group observations.

134. Composition (2; max total 8)
Prerequisite: Mus 14A-B, permission of instructor. Original composition in various forms, styles, and techniques.

136. Orchestration (2; max total 4)
Prerequisite: Mus 14A-B. Technical aspects of orchestral instruments, their use in achieving various tone colors; problems in scoring for school instrumental ensembles.

138. Piano Skills for Teachers in Service (2; max total 4)
Open only to teachers in service. Basic keyboard skills needed by elementary teachers.

139. Elementary Music Education (3)

Prerequisite: Mus 129 (except for secondary credential candidates). Philosophy of elementary school music education; organization of music curriculum materials and activities into lesson plans and projects. Observation and practice of teaching methods.

154A-B. Keyboard Harmony (2-2)

Recommended to students needing additional harmonic drill at the keyboard to increase sensitiveness to music and its structure. Application at the keyboard of all the harmonic materials studied in previous courses.

156. Appreciation of Opera (2)

Primarily for the general college student. May apply on general education requirement in the arts for non-music majors. Selected master works in the standard operatic repertory; phonograph recordings; plot, characterization, period, style, and expressive methods of composers.

166. Appreciation of Symphonic Music (2)

Primarily for the general college student. May apply on general education requirement in the arts for non-music majors. Selected master works from the standard orchestral repertory; phonograph recordings; periods, style, techniques and expressive methods of selected composers.

188. Teaching Piano in Public Schools (3)

Required of students taking the special secondary limited credential in piano. Modern methods of piano teaching; classes in public schools; individual and class teaching; application of methods in Laboratory School.

189. Secondary Music Education (3)

Place and function of music in the high school curriculum; survey of teaching methods and materials; band, orchestra and choral problems.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

206. Advanced Instrumental Techniques (2; max total 4) Summer only

Prerequisite: Mus 106 or equivalent; permission of instructor. Teaching and playing techniques for brass, woodwind, string, and percussion instruments; reed making; acoustical principles and application in teaching; materials and literature.

210. Studies in Performance (1-2; max total 4)

Prerequisite: permission of department chairman. Individual lessons on instrument or in voice; historical, analytical, and practical study of standard literature of all periods in major performance area; preparation for public recitals. (Special fee)

214. Theory Seminar (2; max total 4) Summer only

Prerequisite: permission of instructor. With approval of instructor, each student elects a project of analysis, arranging, composing, or study according to his special capabilities and interests.

220. Research Methods and Bibliography (2)

Prerequisite: undergraduate history of music. Basic bibliography, literature, and research techniques necessary for graduate study in music. Required of all graduate students working for the master's degree in music.

221. Seminar in Music History (2; max total 6 if no era repeated)

Seminar in critical and analytical study of selected works by composers of an era: Renaissance and Baroque; Classic and Early Romantic; Romantic and Contemporary.

224. Studies in Musical Analysis (2; max total 4)

Analysis of selected works; form, thematic and motive development, harmonic structure, compositional devices and their significance.

234. Studies in Composition (2; max total 6)

Prerequisite: permission of instructor. Critical examination of student composition; reference to works of acknowledged composers; development of contemporary technique in structural and harmonic methods. One work in a given classical form required with choice of harmonic and rhythmic style.

236. Studies in Orchestration (2)

Prerequisite: permission of instructor. Studies in writing for the modern symphony orchestra; preparation of scores based on models from Ravel, Bartok, Roussel, and Stravinsky; development of the symphony orchestra and classical scores.

239. Seminar in Music Education (2; max total 4)

Advanced problems in music education according to needs of students enrolled; administration, supervision, vocal, and instrumental fields.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*

299. Thesis or Project (2-6; max total 6)

Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

307. Musical Instrument Repair (1; max see below)

Maximum total credit 3 units, provided instrumental groupings are not repeated. Criteria for selection; techniques for care and repair of musical instruments. Instrumental groupings: brass and percussion; woodwind and strings; piano.

LETTERS AND SCIENCE DIVISION

Division Head	Herbert H. Wheaton
Department	*Chairman*
Anthropology-Sociology	William C. Beatty, Jr.
Criminology	Frank M. Boolsen
Economics	Richard C. Spangler
English	Russell E. Leavenworth
Foreign Language	Edgar A. List
History Department	Francis A. Wiley
Journalism	Paul V. Sheehan
Philosophy	Jack A. Pitt
Political Science	Karl E. Buckman
Social Work	Thomas M. Brigham

The Letters and Science Division includes instructional departments in the fields of the humanities and the social sciences. These departments provide instruction for students seeking a liberal education, including those who expect to enter the professions. Majors in literature, language, philosophy, economics, history, political science, anthropology, and sociology are among those recommended as preparation for graduate schools of business, law, medicine, and theology; for the postgraduate training conducted by certain corporations and government agencies; and for college teaching. Students interested in such professions are invited to seek detailed advice about the preparation recommended and required by consulting the catalogs of the professional schools, the bulletins collected in the college placement office, the summaries under *Preprofessional Preparation* in this catalog, and the counselors in the office of the Dean of Students.

The division offers majors and minors for the bachelor of arts and bachelor of science degrees; preparation for teaching, social work, and criminology; programs leading to newspaper work, magazine writing, and translating for foreign-trade companies and government agencies.

The division offers the master of arts degree in English, foreign language (French, German, or Spanish), economics, history, and social science; the master of science degree in criminology; and the master of social work.

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Foreign Language 192
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Journalism 205
Philosophy 209
Political Science 212
Social Science 217
Social Work 218

ANTHROPOLOGY-SOCIOLOGY DEPARTMENT

(In the Letters and Science Division)

Professors: W. Beatty (Chairman), Dienstein, Wang
Associate Professor: Roth
Assistant Professors: Hale, Marden

The department offers majors for bachelor of arts degrees in anthropology and sociology and a combined sociology-anthropology minor for students majoring in other departments. The majors are designed to provide a broad liberal arts background, as well as an adequate basis for graduate education.

FOREIGN LANGUAGE REQUIREMENT

Two years of satisfactory collegiate study (or equivalent) in one modern foreign language are required of majors in anthropology and sociology. Reading knowledge of the language is emphasized. See the general statement in section on *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement.

MAJORS

The following degree major requirements are in addition to the general education requirement in social science.

Anthropology	*Units*
Anthro 1, 2, 115, Soc 153	12
Anthropology electives (ud)	12
Elect from: Soc 152, 155, 157, 175	6
Elementary statistics; Ling 135, 150, Biol 120	12
	42

Additional Requirements: Soc 1A, Biol 1B.

Sociology	
Anthro 2, 104	6
Soc 1A-B, 153, 175, 176	15
Psych 145	3
Elect from: Soc 111, 140, 152, 155, 157, 165	15
	39

MINOR

The following minor requirements are in addition to the general education requirement in social science.

Sociology-Anthropology	
Elect one group: Anthro 1, 2, 104; or Soc 1A-B, 152 or 155	9
Electives in anthropology and sociology (ud)	9
	18

CREDENTIAL PROGRAM

For information on the credential program consult the departmental advisers and see *Education Division.*

Courses

ANTHROPOLOGY

1. Introduction to Physical Anthropology (3)

May not be used to meet general education requirements in social science. Relation of man and the animals; evolution of man, fossil man, race and racial classification; racial theories.

2. Introduction to Cultural Anthropology (3)

The nature of culture; culture growth and history; survey of cultural phenomena; cultural theory; applied anthropology.

102. Ethnology (3)

Prerequisite: Anthro 2 or permission of instructor. Major theories of culture; survey of culture types and their distribution; ethnological problems.

103. Acculturation (3)

Prerequisite: Anthro 2 or permission of instructor. Impact of western civilization upon nonwestern societies; social and cultural adjustments to impact; disintegration; reinterpretation, and reintegration; place of anthropology in international relations and colonial administration.

104. Social Anthropology (3)

Prerequisite: Anthro 2 or permission of instructor. The place of anthropology in the social sciences; theories and schools in social anthropology; community studies, integration, functionalism, psychological aspects.

105. The American Indian (3)

Prerequisite: Anthro 2 or permission of instructor. Prehistory of western hemisphere; linguistic groups; development, spread, and attainments of native Indian cultures.

107. Civilizations of Southeast Asia (3)

Not open to students with credit in Hist 105B or 107. History and culture of Southeast Asia from earliest times to the present.

108. Civilizations of East Asia (3)

Not open to students with credit in Hist 105A or 108. History and cultures of China, Japan, and Korea from earliest times to the present.

110. Archeological Methods (3)

Prerequisite: Anthro 1, 2, or permission of instructor. Practical work on excavation; use of various instruments employed by excavator; keeping field records; dating methods. (1 lecture, 4 lab hours)

115. Method and Theory in Cultural Anthropology (3)

Prerequisite: Anthro 2. Reading and analysis of major contributions to cultural anthropological thought.

SOCIOLOGY

Note: Former Soc 120 series courses, Soc 180 and 181 are courses with social welfare content and are now listed in the Social Work Department.

1A-B. Principles of Sociology (3-3)

(A) Principal concepts and problems, including personality, social groups, social change and social processes. (B) Prerequisite: Soc 1A. Analysis of conditions in society regarded as disruptive of the social order and subject to remedial action.

111. Sociology of Minority Relations (3)

Prerequisite: Soc 1A or Anthro 2, or permission of instructor. Social processes involved in minority relations in the United States in terms of race, class, caste, ethnicity, politics, and religion; sources of minority attitudes; patterns of minority adjustment; trends in minority relations.

140. Rural and Urban Problems (3)

Prerequisite: Soc 1A or permission of instructor. Comparative characteristics of rural and urban living; social institutions, human behavior, social problems; their impact and influence.

152. History of Social Thought (3)

Prerequisite: Soc 1A or permission of instructor. Leading social thinkers of the Western World from Plato to Comte; comparative study of social philosophers of the East.

153. Modern Sociological Theory (3)

Prerequisite: Soc 1A-B. Contemporary sociological theories; analytical, social action, and functional theories, including conceptualization.

155. Social Institutions (3)

Prerequisite: Soc 1A or permission of instructor. Major social institutions—familial, economic, political, educational, religious; origin and development; functions and interrelationships in contemporary phases of development.

157. Social Change (3)

Prerequisite: Soc 1A or permission of instructor. Social dynamics; factors and forces underlying social change; process of social change; direction of social change.

165. The Family (3)

Prerequisite: Soc 1A or permission of instructor. Nature, historical development, and contemporary trends of the modern family.

175. Sociological Methods (3)

Prerequisite: Soc 1A, Math 40. Methods in sociological-anthropological research.

176. Field Work in Sociology (3)

Prerequisite: Soc 175. Field work in problems which fall within the recognized scope of sociological research.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

CRIMINOLOGY DEPARTMENT
(In the Letters and Science Division)

Professor: Boolsen (Chairman)
Associate Professor: Tocchio
Assistant Professor: Kallam
Part-time: Clegg, Mortland

The Criminology Department provides educational opportunities in the areas of law enforcement and corrections. The law enforcement program is designed for students interested in careers in law enforcement and related areas at the federal, state, and local levels of government, or in allied occupations in government, business, and industry. The corrections program is designed for students interested in careers in probation, parole, penal and correctional institutions, and other affiliated forms of work.

The department offers the bachelor of science and master of science degrees in criminology.

BACHELOR OF SCIENCE DEGREE IN CRIMINOLOGY

The bachelor of science degree in criminology with options in law enforcement or corrections is granted upon completion of a four-year curriculum consisting of 128 semester units. The general degree requirements must be completed, see *Degrees and Credentials*. Each student desiring to major in criminology must select and complete one of the options listed below.

Law Enforcement Option

	Units
Crim 4A-B, 5, 7, 10, 102, 105A-B, 113, 114, 129, 132, 153	37
Psych 111, 118, 152 or 152F	9
Elect from: Crim 120, 170, Jour 113, Pol Sc 160 series, sociology or psychology (ud)	6
	52

Additional Requirements: 4 units of Crim 8 (or satisfactory experience); Engl 72, H Ed 48 (or possession of valid first aid certificate); Jour 17A, PE 10-45 (or course in combatives), Psych 7 or 10, 145, Soc 1A-B, 111, Off Ad 1 or 2; completion of A Ed 153 or Psych 25 recommended before graduate work.

Corrections Option

Crim 102, 105A-B, 107, 120, 132, 133, 135, 153, 170	30
Soc 111, 165	6
S Welf 120, 122, 124, 127, 128	13
Psych 111, 118, 152 or 152F	9
	58

Additional Requirements: Anthro 2, Crim 181, (3 units or satisfactory experience), Engl 72, Psych 7 or 10, 66, 145, Soc 1A-B; completion of A Ed 153 or Psych 25 recommended before graduate work.

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF SCIENCE DEGREE

The graduate program for the master of science degree in criminology is based on the equivalent of the undergraduate major in criminology at Fresno State College. An area of occupational specialization, such as corrections or law enforcement, is required. For specific requirements consult the chairman of the department; for general requirements, see *Degrees and Credentials—Master's Degrees.*

Courses

CRIMINOLOGY

4A. Patrol Function (3)

Open only to criminology majors. Principal concepts and contemporary issues involved in objectives and activities of the patrol force; related California Penal Code and other criminal statutes.

4B. Basic Crime Investigation (3)

Open only to criminology majors. Prerequisite: Crim 4A. Study of basic police investigative process; related laws.

5. Traffic (2)

Open only to criminology majors. Primary traffic functions of the police; traffic law enforcement; traffic direction; accident investigation; contemporary problems; California Vehicle Code.

7. Firearms (2)

Open only to criminology majors. Prerequisite: permission of instructor. Use and care of firearms; explanation of situations warranting use of firearms; legal provisions and restrictions; policy covering use in performance of duty; safety precautions; nomenclature; dry firing and familiarization firing. (1 lecture, 3 range field hours)

8. Directed Policing (1; max total 6)

Open only to criminology majors who are members of the College Student Police Unit. Prerequisite or concurrently: Crim 4A-B; permission of instructor; not open to freshmen and not required of women students. Supervised field experience in police work for interpreting theories developed in parallel criminology courses. Weekly conference with supervisor. (Minimum of 3 field hours per unit.)

10. Police Records (2)

Open only to criminology majors. Organization and installation of a police record system; types and functions of records; recording procedures.

102. Police Organization and Administration (3)

Not open to students with credit in Crim 2. Fundamentals of police organization and administration applied to field operations; records and reports, patrol; traffic; investigation; vice, crime prevention; public relations; police ethics; allied problems.

105A-B. Criminal Law (3-3)

(A) Advanced study of theory, concepts, and philosophy of criminal law. (B) Laws of arrest, search and seizure; criminal procedure; criminal evidence; juvenile law.

107. Correctional Law (3)

Prerequisite: Crim 105A. Basic legal theories, concepts, and laws affecting juveniles and adults in the correctional process.

113. Criminalistics II (4) (Former Crim 115A)

Open only to criminology majors. Prerequisite: Crim 4A-B, Jour 17A; or equivalent. Advanced study of scientific crime investigation and detection methods. (3 lecture, 3 lab hours)

114. Criminalistics II (3) (Former Crim 115B)

Open only to criminology majors. Prerequisite: Crim 4A-B, Jour 17A; or equivalent. Criminal identification systems; identification of persons and property; physical evidence; scientific resources and techniques.

120. Crime Prevention and Juvenile Delinquency (3)

Organization and function of crime prevention agencies; police techniques in the prevention of delinquency and crime; case work; the policewoman; consolidation of community resources in preventing crime and delinquency.

129. Detection of Deception (3)

Open only to criminology majors. Prerequisite: Crim 4A-B or permission of instructor. Historical, physiological, psychological and legal aspects of criminal interrogation; detection of deception techniques; theory and practice of instrumental detection of deception and other interrogation aids; laboratory experiments with polygraph. (2 lecture, 3 lab or demonstration hours)

132. Criminology (3)

Theories of crime causation, sociological factors; organized crime and professional criminals; selected types of social deviants and criminal offenders.

133. Institutional Treatment of Offenders (3)

Prerequisite: Crim 132 or permission of instructor. Modern philosophy and methods in the treatment of adult offenders and juvenile delinquents in correctional institutions. May include field trips.

135. Probation and Parole (3)

Prerequisite: Crim 120, or 132, or permission of instructor. Principles and practices in probation and parole.

153. Psychology of the Criminal (3) (Same as Psych 153)

Psychological bases of crime; motivation, alcoholism, economic and cultural pressures; forms of crime; criminal careers.

170. Research in Criminology (3)

Not open to students with credit in Crim 200. Prerequisite Engl 72 or permission of instructor, senior standing. Research methodology; use of library resources; preparation and handling of materials in criminology; written report required.

180. Training in Public Service (1-6; max total 6)

Open only to criminology majors without law enforcement experience. Prerequisite: permission of instructor. Relates student's classroom studies with occupational and professional experiences. Weekly conference with field supervisor. (Minimum of 3 field hours per unit)

181. Directed Correctional Work Experience (1-6; max total 6)

Open only to criminology majors without correctional work experience. Prerequisite: permission of instructor. Relates the student's classroom studies with occupational and professional experiences. Weekly conference with field supervisor. (Minimum of 3 field hours per unit)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

201. Seminar in Criminology (3)

Prerequisite: Crim 132 or permission of instructor. Theories and research in the etiology of juvenile delinquency and criminal behavior.

204. Seminar in Criminal Law (3; max total 6)

Prerequisite: Crim 105A-B or permission of instructor. Inquiry into principal concepts and contemporary issues involved in selected legal aspects of criminology. Topics vary with each offering.

208. Seminar in Administration (3; max total 6)

Prerequisite: Crim 102 or Pol Sc 164A; or permission of instructor. Analysis of selected theories of organization, administration, and management of agencies concerned with criminal justice. Topics vary with each offering.

227. Seminar in Crime and Delinquency Prevention Programs (2)

Prerequisite: Crim 120 or 132. Policies and programs for prevention and control of delinquency and crime; evaluation of specific programs; principles of prevention and control.

233. Seminar in the Treatment of Offenders (3; max total 6)
(Former Crim 225A-B, 229)

Prerequisite: Crim 133 or equivalent. Modern philosophy and practice in institutional and noninstitutional treatment of offenders. Topics vary with each offering.

270. Advanced Study in Criminology (1-6; max total 6)

Prerequisite: Crim 170, statistics course, department approval of problem. Special problems in criminology; individual study in laboratory, library, or field work; formal written reports. Weekly conference with instructor.

281. Field Work (1-6; max total 6)

Open only to criminology majors. Prerequisite: permission of instructor. Work experience in law enforcement or correctional work.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis or Project (2-4; max total 4)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

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 DEPARTMENT

(In the Letters and Science Division)

Professors: K. Falk, H. Graham
Associate Professor: Spangler (Chairman)
Assistant Professors: Bush, Minick, Taniguchi, E. Winter

The Economics Department prepares students to fill the role of citizens well informed on the economic problems confronting a modern society. Majors in economics are offered training for careers in government, business, and the teaching profession. Those going on to graduate work are given training in sufficient depth and breadth to enable them to pursue their studies in satisfactory fashion.

Foreign Language or Mathematics Requirement

The student must complete two years of satisfactory collegiate study or equivalent of one foreign language *or* a 14-unit sequence consisting of Math 3, 40, 110, and 130. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

ECONOMICS MAJOR

The following bachelor of arts degree major requirements are in addition to the general education requirement in social science.

	Units
Econ 1A-B, 100A-B, 101	15
Elect from: Bus Ad 102, Math 40, 107, 109	3
Elect from: Econ 103, 110, 111, 114, 131A-B, 136, 150, 151, 170, 174, 178, 180, Bus Ad 133, 135, 152	18
	36

ECONOMICS MINOR

The following minor requirements are in addition to the general education requirement in social science.

	Units
Econ 1A-B, 178 or 180	9
Elect from: Econ 100A-B, 101, 103	3
Elect from: Econ 110 or 111, 114, 131A-B, 136, 150, 151, 170, 174; Bus Ad 102, 135	6
	18

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in economics is based on the equivalent of the undergraduate major at Fresno State College. For specific requirements, consult the head of the department; for general requirements, see *Degrees and Credentials—Master's Degrees*.

Foreign Language Requirement

Advancement to candidacy for the master of arts degree with a major in economics requires the passing of an examination demonstrating the ability to read materials of the major in one appropriate foreign language.

Courses

ECONOMICS

1A-B. Principles of Economics (3-3)

Not open to first-semester freshmen. Prerequisite to upper division courses in economics and business. (A) General characteristics of economic system of the United States; organization of society for production and exchange of goods; structural and functional description of basic economic institutions. (B) Elementary economic theory, economic problems of present day society and related public policy.

100A. Economic Theory: Price Analysis (3)

Prerequisite: Econ 1A-B. 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: National Income Analysis (3)

Prerequisite: Econ 1A-B. Classical, Keynesian and post-Keynesian theories on level of income and employment; elements of national income accounting, flow-of-funds analysis; relationship of rate of interest to level of investment; alternative theories of inflation; warranted rates of economic growth.

101. History of Economic Thought (3)

Prerequisite: Econ 1A-B. Evolution of economics as a science; doctrines of different schools of thought—Mercantilists, Physiocrats, Historical School, Classical Economists; contributions of outstanding economists.

102. Contemporary Economic Problems (3; max total 6)

Prerequisite: upper division standing and permission of instructor. Analysis of economic problems and issues which are of public interest and importance at the time the course is given.

103. Economic Fluctuations (3)

Prerequisite: Econ 1A-B; senior standing or permission of instructor. Cyclical movements of business; history, characteristics and measurement; critical examination of business cycle theories and of proposals for reducing economic fluctuations.

110. Economic History of the United States (3)

Recommended: Econ 1A-B. 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)

Recommended: Econ 1A-B. European expansion, fifteenth century to the present; present economic conditions and trends in Europe; interest of United States in European economy.

114. Economics of Underdeveloped Areas (3)

Prerequisite: Econ 1A-B and permission of instructor. Survey and analysis of developmental problems of emergent economies.

131A. Public Finance (3)

Prerequisite: Econ 100A or permission of instructor. Governmental revenues and expenditures at federal, state, and local levels of jurisdiction.

131B. Fiscal Policy (3)

Prerequisite: Econ 100B or permission of instructor. Impact of governmental revenues and expenditures upon levels of employment; fiscal measures as contracyclical devices; debt management; built-in stabilizers.

136. Monetary Policy (3)

Prerequisite: Econ 1A-B, 100A or B, Bus Ad 135; permission of instructor. Monetary policy as a tool for promoting and maintaining economic stability and full employment; controversial issues in monetary policy and lessons of experience.

150. Labor Economics (3)

Prerequisite: Econ 1A-B, 100A or B; or permission of instructor. 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 150 or permission of instructor. Analytical topics from historical viewpoint; evolution of unions and labor legislation interpreted in terms of economic theory.

170. Transportation (3)

Prerequisite: Econ 1A-B. Economics of rail, water, motor, air, and pipeline transportation.

174. Government Regulation of Economic Activity (3)

Prerequisite: Econ 100A or permission of instructor. Justification for regulation, constitutional limitations, public utility regulation, regulation of monopoly; competitive practices; government policy in other areas of economic activity.

178. International Economics (3)

Prerequisite: Econ 100A or B or permission of instructor. International economic relations; problems and policies in the light of fundamental economic theory.

180. Comparative Economic Systems (3)

Prerequisite: Econ 100A or B or permission of instructor. Comparative study of economic systems of the modern world; capitalism, socialism, communism, fascism, and the problems which arise within each.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200. Seminar in Research Methodology (3)

Development and verification of hypotheses in economics; quantitative techniques.

201. Seminar in Economic Theory (3; max total 6)

Advanced topics in economic theory.

210. Seminar in Economic History of United States (3; max total 6)

Prerequisite: Econ 110 or permission of instructor. Critical examination of, and reports on, selected topics in the economic history of the United States.

231. Public Finance (3)

Prerequisite: Econ 131A-B. Advanced topics central to governmental expenditure, borrowing, and revenue collection.

236. Monetary Theory (3)

Prerequisite: Econ 131B, 136 or permission of instructor. Advanced topics, reports, and critical examination of alternative theories and approaches to the study of money.

250. Seminar in Labor Economics (3)

Prerequisite: Econ 150 or permission of instructor. Advanced topics in wage and employment theory, philosophies of trade unionism, impact of collective bargaining on the modern industrial society.

278. Seminar in International Economics (3)

Prerequisite: Econ 178. Advanced topics in international economic theory, foreign exchanges, foreign investment, tariffs and international economics and economic development.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis (2-4; max total 4)

Prerequisite: See *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

ENGLISH DEPARTMENT

(In the Letters and Science Division)

Professors: Larrabee, Lyon
Associate Professors: Leavenworth (Chairman), D. Smith
Assistant Professors: Barrett, R. Billings, Bluestein, Brengelman, Chittick, Everwine, Kupsh, Levine, Logan, O'Neil, Poss, Sibley, Zumwalt
Instructor: Briggs
Part-time: Hill, Kellas, H. Scott, Simpson, Tilghman, P. Williams

The English Department offers a major and a minor in literature and language leading to the bachelor of arts and master of arts degrees. For students majoring in other departments it provides courses of general interest in reading, composition of various kinds, literature, and linguistics. Further, it provides remedial courses in grammar and reading and tutorials in grammar and composition. Tutorial hours are announced in the *Schedule of Courses*.

MAJOR

The major in English for the bachelor of arts degree is designed to accommodate students preparing for postgraduate training in business, law, medicine, theology, civil service, elementary, secondary, and college teaching, and the other vocations that recommend a grounding in the liberal arts as preparation for occupational training. The major consists of 24 upper-division units of which at least 3 are in linguistics. The student proposes a program which, upon recommendation of the adviser and approval by the chairman of the department, becomes his major.

Requirements for the major are in addition to general education requirements and are exclusive of English A and 6. The recommended sequence in general education is English 3, 4, and 20.

MINOR

The minor in English requires 20 units as listed below. In preparation, students should take English 3, 4, and 20. English A and 6 may not count toward the minor.

	Units
English 61 or 162A or B; 105	6
English 134 or 135; 137	6
English 120, or with permission of instructor, 110 or 111	3
English electives	5
	20

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in English is based on the equivalent of the undergraduate major at Fresno State College. For specific requirements consult the *Graduate Bulletin* and the departmental adviser for the master of arts degree; for general requirements, see *Degrees and Credentials—Master's Degrees*.

Foreign Language Requirement

Advancement to candidacy for the master of arts degree with a major in English requires the passing of an examination demonstrating a reading knowledge of one foreign language.

Courses

ENGLISH

Note: Courses in linguistics, formerly carried under anthropology and English, are listed under Linguistics following the courses in English below.

A. Elementary Composition (2)

Required of all students who have not passed the entrance examination in English; not applicable on the English major and minor; not open to students with credit in Engl 1 or 3. A remedial course in the fundamentals of writing. (2 lectures, 1 section)

1. Composition and Reading (3) (Former Engl 1A)

The one-semester course in composition; see also Engl 3 and 4, the year sequence in composition. Engl 1 is not open to students with credit in Engl 3 or 4. Prerequisite: passing grade on the English entrance examination. Theory and practice of composition; reading as a stimulus to thoughtful writing. Themes, chiefly expository; one long paper based upon the investigation of a selected topic.

3. Logic and Composition (3) (Same as Phil 3)

Engl (or Phil) 3 and Engl 4 constitute a year's sequence in composition; intended primarily for academic majors and others preparing for the professions. Meets general education requirement either in philosophy (if followed by Engl 4) or in written English (if followed by Engl 20). Prerequisite: passing grade on English entrance examination or equivalent; Psych 7 (preferably concurrently). An investigation of language, its uses in scientific contexts; elementary deductive logic; philosophical problems in formation and validation of scientific theories. Ten themes assigned on philosophical and cultural problems posed by the development of science.

4. Composition and Reading (3)

Meets general education written English requirement. Engl 3 and 4 taken in sequence constitute a year course in composition. Prerequisite: Engl 3; Hist 10, preferably concurrently. Analytical and expository writing based on critical reading; investigative papers—interpretation of evidence supporting historical statements, civic policies, judgments.

6. Improvement in Reading Technique (2)

For students whose scores on the entrance examination in reading are significantly lower than their scores on the entrance aptitude test. Not applicable on the English major and minor. Analysis of reading practices leading to efficient methods of reading and studying.

10. Writing of Poetry (3)

Prerequisite: Engl 1 or 3, 20, or permission of instructor. The writing of exercises and the study of professional poetry in simple poetic forms.

11. Writing of Fiction (3)

Prerequisite: Engl 1 or 3, 20, or permission of instructor. The writing of short stories and exercises in scene construction, dialogue, description, narration, and exposition; reading and analysis of short stories.

14. English as a Foreign Language (3)

Limited to students from non-English-speaking countries. Reading, writing, and speaking the English language.

20. Introduction to Literature (3) (Former Engl 1B)

Prerequisite: Engl 1 or 3. Reading of literary masterpieces of various types, ages, and countries as the basis for class discussion of content, form, and theme and as a stimulus to critical writing.

61. Shorter Shakespeare (3) (Former Engl 61A-B)
Not open to English majors. Prerequisite: Engl 20. A selection of Shakespeare's plays and poems.

62. Introduction to Theatre (2) (See Drama 62)

72. Report Writing (3)
Prerequisite: Engl 1 or 3. Methods of explaining processes and theories, reporting special investigations, preparing technical and business reports; general practices of good writing.

84. The Literature of Protest (3)
Prerequisite: Engl 20. Literature of social and moral reform.

93. Forms of Literature (3)
Prerequisite: Engl 20. Selections from lyric poetry, drama, the novel, in successive semesters. Reading and close analysis.

100. Beowulf to Marlowe (3)
Open to second-semester sophomores. Prerequisite: Engl 4, 20, or equivalent. Epic and romance, Chaucer, drama, other poetry and prose.

101. More to Milton (3)
Prerequisite: Engl 4, 20, or equivalent. Elizabethan, Jacobean, and Puritan drama, poetry, and prose; Milton.

102. Dryden to Burns (3)
Open to second-semester sophomores. Prerequisite: Engl 4, 20, or equivalent. Restoration and Eighteenth Century poetry and prose; the novel; the drama.

103. Wordsworth to Shaw (3)
Prerequisite: Engl 4, 20, or equivalent. Romantic, Victorian, and *fin de siecle* poetry and prose; the novel; Shaw.

104. American Literature to 1914 (3)
Open to second-semester sophomores. Prerequisite: Engl 4, 20, or equivalent. Survey of American literature; analysis of major works, relationship to literary and ideological movements.

105. Twentieth Century Literature (3)
Open to second-semester sophomores. Prerequisite: Engl 4, 20, or equivalent. Major trends in British and American literature from World War I to the present.

110. Advanced Writing: Poetry (3; max total 6)
Prerequisite: Engl 10 or permission of instructor. Exercises in the more difficult poetic forms, individual projects, reading and analysis of related poetry.

111. Advanced Writing: Fiction (3; max total 6)
Prerequisite: Engl 11 or permission of instructor. Individual projects in the short story and the novel; reading and analysis of related material.

120. Rhetoric (3)
Prerequisite: Engl 1, 3 or 4; 134 or 135, 137. Expository writing and analysis in relation to traditional and contemporary theories of composition.

124. Magazine Feature Writing (3) (See Jour 124)

134. Structure of English (3) (Same as Spch 134)
Empirical study of English phonology, morphology, syntax, spelling, and punctuation.

135. Introduction to Linguistics (3) (See Ling 135)

137. American English (3) (Former Ling 131) (Same as Spch 137)
Prerequisite: Engl 134 or 135. Empirical study of current American English, with reference to regional, institutional, and occasional variations.

140. Studies in Medieval Literature (3; max total 6)
Prerequisite: Engl 100 or equivalent. Intensive study of an important literary topic in the period.

141. Studies in Renaissance Literature (3; max total 6)
Prerequisite: Engl 101 or equivalent. Intensive study of an important literary topic in the period.

142. Studies in Restoration and Eighteenth Century Literature (3; max total 6)
Prerequisite: Engl 102 or equivalent. Intensive study of an important literary topic in the period.

143. Studies in Nineteenth Century Literature (3; max total 6)
Prerequisite: Engl 103 or equivalent. Intensive study of an important literary topic in the period.

144. Studies in American Literature (3; max total 6)
Prerequisite: Engl 104 or equivalent. Intensive study of an important literary topic in the period.

145. Studies in Twentieth Century Literature (3; max total 6)
Prerequisite: Engl 105 or equivalent. Intensive study of an important literary topic in the period.

160. Chaucer (3)
Prerequisite: Engl 100 or permission of instructor. Chaucer and his age; *The Canterbury Tales* and other selected poems.

162A-B. Shakespeare (3-3) (Same as Drama 162A-B)
Engl 162A is not prerequisite to 162B. Prerequisite: Engl 20. Each course covers half the plays of Shakespeare, from his earliest to his latest; relation of his works to the Elizabethan theater and to contemporary thought and literature; (A) includes the Sonnets, (B) includes "Venus and Adonis" and "The Rape of Lucrece."

165. Milton (3)
Prerequisite: Engl 101 or equivalent. Milton and his age; early poems, *Paradise Lost*, *Paradise Regained*, *Samson Agonistes*, and selected prose.

176. Current Books (3)
Lectures upon the latest books—fiction, drama, poetry, biography, and modern problems.

180. World Literature: Ancient and Medieval (3)
Prerequisite: Engl 20. Greek, Roman, and medieval literature in English translations.

181. World Literature: Renaissance and Modern (3)
Prerequisite: Engl 20. Modern literatures of continental Europe; literary forms, movements, and relationships; reading of masterpieces in English translation.

182. The Bible as Literature (3)
Selected prose and poetry in the King James translation.

183. Living Philosophies in World Literature (3) (Same as Phil 183)
Ways in which the world's great literature has attempted to deal with basic philosophical problems.

184. Readings in Dramatic Literature (2) (See Drama 184)

185. Studies in Literature (3; max total 6)
Prerequisite: Engl 20. Special studies in literature varying from semester to semester.

190. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

191. Literary Criticism (3)
Prerequisite: Engl 4, 20, or equivalent. Major documents in literary criticism from Plato to the present.

192. Theory of Language (3) (See Phil 192)

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200A-B. Graduate Survey (3-3)
Open only to second-semester seniors and graduates majoring in English. Extensive, individually directed readings in literature and related subjects.

220. Studies in Rhetoric (3; max total 9 if no topic repeated)
Prerequisite: advanced composition or equivalent. Seminar in rhetorical theory in relation to social history; critical analysis of current rhetorical doctrine.

230. Studies in the English Language (3; max total 9 if no topic repeated) (Former Engl 206)
Prerequisite: Engl 135 or permission of instructor. Seminar in English and American linguistics.

250. Studies in Literary History (3; max total 9 if no topic repeated)
Prerequisite: major or minor in English; permission of instructor. Seminar in an aspect of literary history: type, period, movement, or an individual author.

280. Studies in Criticism (3; max total 9 if no topic repeated)
Prerequisite: major or minor in English; permission of instructor. Seminar in literary criticism.

290. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

299. Thesis or Project (2-4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

300. English Colloquium (2; max total 6)
Credit is not applicable to degrees or major requirements in credentials. Prerequisite: experience in teaching. Problems in composition, literature, or linguistics in relation to teaching.

LINGUISTICS

Ling 135. Introduction to Linguistics (3) (Former Ling 100) (Same as Engl, Spch 135)
Introduction to descriptive and historical linguistics; relationships between language and culture.

Ling 150. Descriptive Linguistics (3)
Prerequisite: Ling 135. Theory and practice of descriptive linguistics.

FOREIGN LANGUAGE DEPARTMENT

(In the Letters and Science Division)

Professors: Rojas, Bird, Brenninger
Assistant Professors: Carnero, Elgorriaga, Ensslin, Jasutis, Kinzel, L. Lewis, List (Acting Chairman), Nagy, Pella, Poythress
Part-time: Lawson, McKeighan, Martinez, Nickel, Zepeda

The Foreign Language Department aims to teach students to understand, speak, read, and write the foreign languages offered, with varying degrees of emphasis upon those objectives according to their needs and interests; to promote an interest in and an understanding of foreign civilizations and of the problems of foreign nations as they arise day by day; to contribute to students' knowledge of English through comparative study of a foreign language; to prepare students to teach foreign languages in the elementary and secondary schools; and to give specialized professional training for positions such as interpreter, translator, consular representative, and foreign trade specialist.

CREDIT ALLOWANCE IN FOREIGN LANGUAGE

Normally each year of high school study in a foreign language is the equivalent of one semester of college study. However, students who expect to continue in a language taken in high school must take a placement test before enrolling. College credit may be earned in a class in which the student is placed, provided he is not repeating more than one year of high school work. If a student places in a course below this, he must audit the course, or courses, until he reaches the level where he is eligible to receive credit. Consult the *Schedule of Courses* for dates of placement tests. See also *Degrees and Credentials—Foreign Language Requirement.*

MAJORS AND MINORS

The appropriate 1A-B courses or their equivalent are required for major and minor programs in French, German, and Spanish.

MAJORS

French	*Units*
Fr 2A-B, 109A-B, 112A-B	18
French electives (ud)	10
	28
German	
Germ 2A-B, 115A-B, 116A-B	18
German electives (ud)	10
	28
Romance Languages	
Fr 1A-B, 2A-B; 109A-B or 112A-B	20
Span 1A-B, 2A-B; 107A-B or 103A-B	20
	40
Spanish	
Span 2A-B, 103A-B, 107A-B	18
Spanish electives (ud)	10
	28

MINORS

French		*Units*
Fr 2A-B	0-	6
Fr 50A-B, 101 (4 un), 137		11
Elect from: Fr 101, 109A-B, 112A-B	10-	4
		21

German		
Germ 2A-B	0-	6
Germ 50A-B, 101 (4 un), 137		11
Elect from: Germ 101, 115A-B, 116A-B	10-	4
		21

Latin		
Lat 1A-B, 3A-B		12
Latin electives (ud)		8
		20

Russian		
Russ 1A-B, 2A-B		18
Russian electives (ud)		6
		24

Spanish		
Span 2A-B	0-	6
Span 50A-B, 101 (4 un), 137		11
Elect from: Span 101, 103A-B, 104A-B, 107A-B	10-	14
		21

LATIN-AMERICAN STUDIES MAJOR

Anthro 105; Geog 142, 143	9
Hist 8A-B, 160A-B, 163, 164; Pol Sc 146	19
Port 1A-B; Span 2A-B, 104A-B	18
	46

Additional Requirements: Anthro 2, Pol Sc 1A-B.

CREDENTIAL PROGRAM

For information on the credential program consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The master of arts degree in foreign language is granted in French, German, or Spanish. The graduate programs for the degree are based on the equivalent of the respective undergraduate majors in these areas at Fresno State College. For specific requirements consult the *Graduate Bulletin* or the departmental graduate committee chairman; for general requirements, see *Degrees and Credentials —Master's Degrees.*

Courses

FOREIGN LANGUAGE

118A-B. Twentieth Century Literature (3-3; max total 6 in each language)
Analytical and critical study of twentieth century literary production of the country through lectures in the target language (except Russian), outside readings, and one written report each semester in the language.

130A-B. Foreign Language in the Elementary School (2-2)
F Lang 130A may be repeated once in each language; F Lang 130B may not be repeated. Not open to students with credit in Span 120A-B. (A) Intensive drill on phonetics through individual attention, audio-lingual-visual aids; pronunciation, enunciation, intonation. (B) Methods, materials, bibliography for foreign languages in the elementary school.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200. Research Methods and Bibliography (2)
Prerequisite: bachelor's degree in a foreign language or permission of instructor. Seminar in techniques of research; individual study, preparation of materials and their use for documentation in the language of specialization.

201. Foreign Language Linguistics (2; max total 4 if no language repeated)
Prerequisite: Latin 1B; major or minor in language of specialization; permission of instructor. Oppositions in language; phonetic and phonemic description; allophonic and phonemic perturbations; speech levels; dialects.

202. Seminar in Historical Linguistics (2; max total 4 if no language repeated)
Prerequisite: Latin 1B; major or minor in language of specialization; permission of instructor. Historical method; diachronic and synchronic considerations; language change; articulatory oppositions; Latin phonology and distributions; morphology, syntax; dialects; comparison with other Romance languages.

210. Seminar in Literary Studies (3; max total 12 if no topic repeated)
Prerequisite: equivalent of undergraduate major in language of specialization. Seminar in critique and analytical study of selected topics, periods, or specific literary figures.

290. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

299. Thesis or Project (2-6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

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 2 or more years of college Spanish. Basic elements of the language; modern methods of foreign language instruction in the elementary schools; repeatable in sequence—pronunciation, methods, phonetics, advanced methods.

FRENCH

1A-B. Elementary French (4-4)

Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of French through practice in speaking, reading, and writing. (4 lecture, 1 lab hour)

2A-B. Intermediate French (3-3)

(A) Prerequisite: Fr 1B or two years of high school French. Grammar review; modern short stories or plays. Sight reading; weekly compositions; outside reading and reports. (B) Prerequisite: Fr 2A or three years of high school French. French civilization; selected poems, prose or dramatic works and one novel by French men of letters. Class discussion; occasional compositions; sight reading. Conducted in French.

50A-B. Oral French (2-2)

Prerequisite: Fr 1B; 2A or 2B (must be taken concurrently). Oral drill for pronunciation; conversation on assigned topics; brief talks; extemporaneous discussions. (2 lecture, 1 lab hour)

101. Composition and Conversation (2; max total 8)

Prerequisite: Fr 2B. Idioms; written translations into French; compositions on assigned topics; oral exercises. Emphasis on grammar and syntax.

109A-B. Survey of Literature, Earlier Period (3-3)

Prerequisite: Fr 2B. History of French literature, principal documents and authors from Chanson de Roland to André Chenier; renaissance, seventeenth and eighteenth centuries. Lectures and discussions; one paper each semester.

112A-B. Survey of Literature, Nineteenth Century (3-3)

Prerequisite: Fr 2B. Chief movements, works and authors from 1789 to the present; Romanticism, Realism, the Parnasse, Naturalism and Symbolism. Lectures and discussions; one paper each semester.

137. Applied Linguistics (3) (Former Ling 133)

Prerequisite: Fr 101 (or concurrently); Engl 134. Phonological, morphological, syntactical, and lexical structure of French; conflicts with English structure; linguistics problems in design of teaching materials.

150A-B. The French Novel (2-2)

Prerequisite: Fr 2B. History of the novel in France from its origin to the present.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Foreign Language*.

GERMAN

1A-B. Elementary German (4-4)

Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of German through practice in speaking, reading, and writing. (4 lecture, 1 lab hour)

2A-B. Intermediate German (3-3)

Prerequisite: Germ 1B or two years of high school German. Translation; sight-reading; conversation; grammar review.

50A-B. Oral German (2-2)

Prerequisite: Germ 1B. May be taken concurrently with Germ 2A. Conversation on assigned topics; brief talks by students; short scenes from plays. (2 lecture, 1 lab hour)

61. Literature of the Sciences (2)

Prerequisite: Germ 1B passed with C or better. Selected readings in chemistry, geology, physics and mathematics for scientific vocabularies; use of standard periodicals.

101. Composition and Conversation (2; max total 8)

Prerequisite: Germ 2B. Idioms; written translations into German; compositions on assigned topics; oral exercises. Emphasis on grammar and syntax.

115A-B. Survey of Literature, Earlier Period (3-3)

Prerequisite: Germ 2B. Reading and discussion of representative selections from the *Nibelungenlied,* Wolfram, Gottfried, Luther, Lessing, Goethe, Schiller.

116A-B. Nineteenth Century Literature (3-3)

Prerequisite: Germ 2B. Reading and discussion of representative selections from Tieck, Eichendorff, Hoffmann, Grimm, Kleist, Heine, Grillparzer, Keller, Hauptmann, Sudermann.

137. Applied Linguistics (3) (Former Ling 134)

Prerequisite: Germ 101 (or concurrently); Engl 134. Phonological, morphological, syntactical, and lexical structure of German; conflicts with English structure; linguistic problems in design of teaching materials.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study.*

200 series. Graduate courses are listed under *Foreign Language.*

ITALIAN

1A-B. Elementary Italian (3-3)

Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Italian through practice in speaking, reading, and writing. (3 lecture, 2 lab hours)

LATIN

1A-B. Elementary Latin (3-3)

Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Latin through practice in reading and writing.

3A. Latin Composition (3)

Prerequisite: Lat 1B or 2 years of high school Latin. Active command of grammar and syntax.

3B. Medieval Latin (3)

Prerequisite: Lat 3A. Selections from the *Carmina Burana, Patrologia Latina, Anthologia Latina,* Medieval Hymns, *Gesta Romanorum,* Einhard, and others.

101A-B. Advanced Grammar and Composition (2-2)

Prerequisite: Lat 3B or 4 years of high school Latin. Review of grammatical principles; exercises in prose composition.

131. Classical Latin (3)

Prerequisite: Lat 3B. Recommended: Lat 101A concurrently. Readings in Latin from representative Roman authors supplemented by readings in English on political and cultural backgrounds.

132. Renaissance Latin (3)

Prerequisite: Lat 131. Recommended: Lat 101B concurrently. Readings in Renaissance Latin.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

PORTUGUESE

1A-B. Elementary Portuguese (3-3)

Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Portuguese through practice in speaking, reading, and writing. (3 lecture, 2 lab hours)

RUSSIAN

1A-B. Elementary Russian (5-5)

Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Russian through practice in speaking, reading, and writing. (4 lecture, 1 lab hour)

2A-B. Intermediate Russian (4-4)

Prerequisite: Russ 1B or equivalent as determined by examination. (A) Review of grammar and syntax; composition; oral practice; reading of short stories. (B) Oral and written composition; reading of modern stories and novels. Conducted in Russian.

50A-B. Oral Russian (2-2)

Prerequisite: Russ 1B, 2A, or 2B. Oral drill for intonation and pronunciation; conversation on assigned topics; brief talks; extemporaneous discussions. (2 lecture, 1 lab hour)

101. Composition and Conversation (3; max total 9)

Prerequisite: Russ 2B or equivalent. Continuation of prose composition and oral-aural practice for mastery of the finer points in grammar and syntax.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

SPANISH

1A-B. Elementary Spanish (4-4)

Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Spanish through practice in speaking, reading, and writing. (4 lecture, 1 lab hour)

2A-B. Intermediate Spanish (3-3)

Prerequisite: Span 1B or two years of high school Spanish. (A) Review of grammar; tenses with emphasis upon subjunctive mood and irregular verbs; prose composition; reading of typical modern novels and plays. Outside and sight reading. (B) Composition; conversation; forms of correspondence; talks on Spanish civilization; modern prose and drama. Written report on private reading. Conducted in Spanish.

50A-B. Oral Spanish (2-2)

Prerequisite: Span 1B. May be taken concurrently with Span 2A-B. Enrollment limited. Common idioms; correct expression; simple dialogues and plays. (2 lecture, 1 lab hour)

55A-B. Practical Conversation (2-2)

Prerequisite: Span 1B or two or more years of high school Spanish. More advanced than Span 50A-B. Common idioms and correct usage; expression and gestures; practical vocabulary for daily life and travel. (2 lecture, 1 lab hour)

101. Composition and Conversation (2; max total 8)

Prerequisite: Span 2B. Idioms; written translations into Spanish; compositions on assigned topics; oral exercises. Emphasis on grammar and syntax.

103A-B. Survey of Nineteenth Century Literature (3-3)

Prerequisite: Span 2B. (A) Poetry; drama; prose of Romanticism. Reading of typical authors; oral reports and discussion; one written report; *costumbristas.* (B) Realism in novel and drama. Oral reports and discussion; one written report. Conducted in Spanish.

104A-B. Spanish-American Literature (3-3)

Prerequisite: Span 2B. (A) Colonial period: historical; epics of conquest; poetry of outstanding figures such as Sor Juana Inez and others; oral reports and discussion; one written report. (B) Republican period: novel, short story, and essay; special attention to poetry of *modernistas;* the Romantic poets; oral reports and discussion.

107A-B. Survey of Literature, Earlier Period (3-3)

Prerequisite: Span 2B. (A) Beginnings of Spanish language and literature. Epic; lyrical and didactic poetry; beginnings of prose and national drama; picaresque, chivalric, and pastoral novel. Reports and discussion. (B) Cervantes and other prose writers; national drama with Lope de Vega, Tirso de Molina, Ruiz Alarcón, and others. Oral reports and discussion; one written report. Lectures in Spanish.

137. Applied Linguistics (3) (Former Ling 132)

Prerequisite: Span 101 (or concurrently); Engl 134. Phonological, morphological, syntactical, and lexical structure of Spanish; conflicts with English structure; linguistic problems in design of teaching materials.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study.*

200 series. Graduate courses are listed under *Foreign Language.*

HISTORY DEPARTMENT

(In the Letters and Science Division)

Professors: Wiley (Chairman), C. Nelsen
Associate Professors: Canales, Cobb, Comegys
Assistant Professors: Bilderback, Bohnstedt, W. Green, Matthew, Nalbandian
Instructors: Everett, Perry
Part-time: Klassen, Sawyers

A primary function of the History Department is to give students a liberal education in world and American civilization. It aims to bring to them an understanding of modern society by reviewing the achievements of the past. Thus the department aims to prepare students to be enlightened citizens equipped with the broad cultural background essential to studies in the fields of education, philosophy, literature, law, government, journalism, public service, and business; all of which today demand a greater grasp of vital domestic and foreign problems.

The department offers a major and a minor in history for the bachelor of arts degree, a graduate program in history for the master of arts degree, and courses for use in teaching credential programs.

THE AMERICAN HISTORY REQUIREMENT

The American history requirement for graduation should be fulfilled by Hist 10. The following courses may be substituted for Hist 10: Hist 8A-B, 171-173-174.

HISTORY MAJOR

The following major requirements are in addition to the general education requirement in social science.

	Units
Hist 1, 2 or 4A-B (exclude courses used for general education)	3–6
Hist 8A-B, 199	9
Elect from: Hist 107, 108, 111A-B, 121, 131, 135, 136 163, 164, 165A-B	9–12
Elect from: Hist 158, 167, 171, 173, 174, 175, 176, 181, 185, 189A-B	9–12
Elect from: Hist 120, 137, 138, 141, 146, 147, 151, 152, 155, 160A-B	9–12
	42

Foreign Language Requirement

Two years of satisfactory collegiate study (or equivalent) of one foreign language are required of majors in history. See the general statement in section on *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

HISTORY MINOR

The following minor requirements are in addition to the general education requirement in social science.

	Units
Hist 1, 2 or 4A-B (exclude course if used for general education); 8A-B	9–12
Elect from: Hist 107, 108, 111A-B, 121, 131, 135, 136, 163, 164, 165A-B	3–6
Elect from: Hist 158, 167; 171, 173, 174; 175, 176, 181, 185; 189A-B	6–9
Elect from: Hist 120, 137, 138, 141, 146, 147, 151, 152, 155, 160A-B	3–6
	24

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in history is based on the equivalent of the undergraduate major at Fresno State College. For specific requirements, consult the chairman of the department; for general requirements, see *Degrees and Credentials—Master's Degrees.*

Foreign Language Requirement

Advancement to candidacy for the master of arts degree with a major in history requires the passing of an examination demonstrating the ability to read materials of the major in one appropriate foreign language.

Courses

HISTORY

1. Western Civilization to 1650 (3)

Meets general education requirement in the area of man and culture. Foundations of western civilization; interdependence of cultures and peoples; cultural development from prehistoric times to 1650. (1 lecture, 2 quiz sections.)

2. Western Civilization Since 1650 (3)

Not open to students with credit in Hist 4A-B. Meets general education requirement in the area of man and culture. Political, social, and cultural history of Europe since 1650; European expansion and impact of western civilization upon the non-European world; Asian and African nationalist movements in 19th and 20th centuries. (1 lecture, 2 quiz sections)

4A-B. Modern Europe (3-3)

Not open to students with credit in Hist 2. Prerequisite to upper division world history courses. European history from 1500 to present.

8A-B. History of the Americas (3-3)

Hist 8A is not prerequisite to 8B. Survey of Western Hemisphere history from discovery to the present; evolution of contemporary American states. The year course satisfies the American history requirement in general education.

10. American History (3) (Former Soc Sc 3A)

Meets the American history requirement in general education. Not open to freshmen or to students with credit in Hist 8A-B or equivalent. Interaction of geographic, economic, political, and cultural forces in transformation of an agrarian society into a complex, industrial, urban order; emergence of ideals and procedures known as the American way of life.

107. Civilizations of Southeast Asia (3) (Former Hist 105B)

Not open to students with credit in Anthro 107. History and cultures of Southeast Asia from earliest times to the present.

108. Civilizations of East Asia (3) (Former Hist 105A)

Not open to students with credit in Anthro 108. History and cultures of China, Japan, and Korea from earliest times to the present.

111A-B. Ancient World (3-3)

Prerequisite: Hist 4A-B or equivalent. Survey of the ancient Mediterranean world. (A) The Near East and Greece from the earliest times to Philip of Macedon. (B) Alexander the Great, the Hellenistic world, Rome to the reign of Constantine.

120. Byzantine History (3)

Prerequisite: Hist 1 or 4A-B or equivalent. Eastern Roman Empire from the founding to the fall of Constantinople; the role and development of the Church, internal development, and its relations with the Islamic, Latin, and Slavic worlds.

121. Medieval Europe (3)

Prerequisite: Hist 4A-B or equivalent. European history from the fall of the Roman Empire to the beginning of modern times; social, cultural, religious, and economic foundations of Western Europe.

131. Renaissance and Reformation (3)

Prerequisite: Hist 4A-B or equivalent. History of the foundations of modern Europe during the 14th, 15th, and 16th centuries.

135. Moslem World (3)

Prerequisite: Hist 4A-B or permission of instructor. Political and cultural development of the Arabs, Turks, Berbers, and other Moslem peoples from Mohammed to the present.

136. Africa (3)

Prerequisite: permission of instructor. Survey of the chronological development and the indigenous and foreign influences which have created modern Africa.

137. Russian Civilization to 1800 (3) (Former Hist 137A)

Prerequisite: Hist 4A-B or permission of instructor. The country and peoples of Russia from the ninth century to 1800.

138. Russian and Soviet Civilization Since 1800 (3) (Former Hist 137B)

Prerequisite: Hist 4A-B or permission of instructor. Political, cultural, and social progress of the Russian people during the 19th and 20th centuries.

141. Europe 1618-1815 (3)

Prerequisite: Hist 2 or 4A-B or equivalent. European culture, institutions, and politics from the start of the Thirty Years' War to the end of the Napoleonic Era.

146. Europe 1815-1914 (3)

Not open to students with credit in Hist 145 prior to September 1964. Prerequisite: Hist 2 or 4A-B or equivalent. Political, social, and cultural development of Continental Europe from the Congress of Vienna to the outbreak of the first world war.

147. Europe Since 1914 (3)

Prerequisite: Hist 4A-B or equivalent. The European nations in two world wars; rise and character of totalitarian movements; social and economic developments; artistic achievements, new intellectual currents; revolt of Asia and Africa against European dominance.

151. England to 1603 (3) (Former Hist 151A)

Political, economic, and cultural development of the British Isles; constitutional growth; ancient and medieval times through the Renaissance and Reformation to the end of the Tudor Period.

152. England Since 1603 (3) (Former Hist 151B)

Main currents in the thought, culture, and social progress, with emphasis upon constitutional growth, of the British peoples from 1603 to the present.

155. British Empire Since 1714 (3)

Prerequisite: Hist 4A-B or equivalent. Older overseas empire and break-up; newer empire after 1783; rise, federation, and imperial relations of self-governing dominions; crown colony system; India under the British; British expansion in Africa and the Pacific.

158. Canada (3)

Prerequisite: Hist 8A-B or equivalent. Discovery, growth and expansion of Canada, social, economic and political institutions from the French regime through British rule to the Transcontinental Dominion.

160A-B. Spain and Portugal (2-2)

Prerequisite: Hist 4A-B or permission of instructor. (A) Development of the Iberian peninsula from prehistoric times to the Napoleonic Invasion of 1808. (B) From 1808 to the present; political, social and economic institutions; outstanding literary works.

161. Mexico Today (2) Summer only

Taken concurrently with field trip to Mexico and Span 55A or B. Recommended: Hist 165A-B. Social, economic, and cultural aspects; revolution of 1910; rise of national consciousness; Mexico's place in the future.

163. Colonial Latin America (3)

Prerequisite: Hist 8A-B or equivalent. The Age of Discovery, European and American background; development of political, social, and economic institutions of the Spanish and Portuguese empires in America.

164. Republics of Latin America (3)

Prerequisite: Hist 8A-B or equivalent. Rise of modern Hispanic American states since Independence; solutions to problems posed by geography, political inexperience, racial variations, anticlericalism; impact of Industrial Revolution in Mexico, Argentina, Chile, Colombia, and Brazil.

165A. Mexico to 1867 (2)

Pre-Columbian: culture, economy, political phases of Aztec empire; rapid review of Spanish colonial government and administration; problems facing independence; political unrest in republican period to 1867.

165B. Mexico Since 1867 (2)

Diaz régime, rise of modern Mexico; Mexican Revolution, destructive and constructive phases; consequent political, economic, and social upheaval; return to stability, Mexican intellectual trends which caused or accompanied the events considered.

167. American Foreign Policy (3)

Prerequisite: Hist 4A-B, 8A-B, or equivalent. Principles, ideals, and policies of United States in foreign relations.

171. Early American History, 1607-1787 (3)
Prerequisite: Hist 8A-B or equivalent. First of a sequence of three courses covering the full period of history of the United States; political and economic factors; social and cultural development.

173. United States through the Nineteenth Century (3)
Not open to students with credit in Hist 172. Prerequisite: Hist 8A-B or equivalent.

174. United States as a World Power, 1896 to Date (3)
Prerequisite: Hist 8A-B or equivalent.

175. Representative Americans (2)
Biographical sketches of leading characters in American history from Revolution to present. Lectures and reading from standard biographies.

176. Social and Intellectual History of the United States (3)
Prerequisite: Hist 8A-B or permission of instructor. Development of the American people; leading ideas and values in a predominantly rural and agrarian society.

181. Westward Movement (3)
Prerequisite: Hist 8A-B or equivalent, or permission of instructor. Development of western civilization in United States; movement of people and ideas from east to west, persistence and significance.

185. San Joaquin Valley (2)
San Joaquin Valley from Indian days to present; recent expansion in agriculture and industry.

189A-B. California (2-2)
Prerequisite: Hist 8A-B or equivalent; upper division standing. 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.

190. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

199. Advanced Study in History (3)
Not open to students with credit in Hist 200. Prerequisite: upper division standing, major in history or political science; permission of instructor. Introductory course for advanced work; bibliography, research techniques, historical writing; appraisal of historians of contemporary significance.

GRADUATE COURSES
(See *Course Numbering System—Definitions and Eligibility*)

202. Seminar in Historiography (3; max total 6 if area not repeated)
Prerequisite: major or minor in one of the social sciences or permission of instructor. Advanced studies in a field of history—American, Latin American, European; writings and philosophies of great historians; development of historiography.

240. Seminar in European History (3; max total 6)
Open only to history and social science majors. Prerequisite: Hist 199 or permission of instructor.

263. Seminar in Latin-American Studies (3; max total 6)
Prerequisite: one of the following—Hist 160A-B, 163-164, 165A-B, or Span 104A-B; and Hist 199 or permission of instructor. Recommended: reading knowl-

edge of Spanish or Portuguese. Research in specific areas of Hispanic American history and culture. Field trips to the University of California and Bancroft Libraries.

270. Seminar in American History (3; max total 6)

Open only to history and social science majors.

278. Seminar in Recent Interpretations of American History (3; max total 6 if topic not repeated)

Prerequisite: teaching credential with social science major; or history major or minor. Examination of selected problems in American history in the light of new research discoveries; extensive use of scholarly journals.

280. Seminar in Social Science (3; max total 6)

289. Seminar in California History (3; max total 6)

Prerequisite: Hist 189A-B. Research on special problems in California history.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis (2-4; max total 4)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

JOURNALISM DEPARTMENT

(In the Letters and Science Division)

Professors: Sheehan (Chairman), Duke, Shepard
Instructor: Rehart

The program leading to a bachelor of arts degree in journalism prepares students for communications and editorial employment with newspapers, magazines, radio and television stations, and for related types of work in public relations, industrial journalism, technical journalism, general publishing, advertising, and teaching. A broad general education is required in addition to special study in journalism.

The Journalism Department is accredited by the American Council on Education for Journalism. The news-editorial sequence is specifically accredited by the Council. The department is a member of the American Association of Schools and Departments of Journalism and the American Society of Journalism School Administrators.

MAJOR

A bachelor of arts degree in journalism requires proficiency in communication. Students must pass English 1 or 3 with a minimum grade of C and pass a typing test. All journalism majors are required to take a core of courses, totaling 20 units, in the news-editorial field as part of the major program. The remaining journalism courses needed to meet major requirements may be chosen in one of following areas of specialization: news-editorial, public relations and advertising, radio and television news communication, and technical writing and editing.

News-Editorial *Units*

Jour 8A-B, 109A-B, 110A-B, 114, 115	20
Jour 104, 108, 126, 181	11
Elect from: Jour 1, 2, 17A, 17B, 102, 117, 124, 149, 150	5
	36

Additional Requirements (beyond general education requirements): IA 60; 6 units (incl. 3 ud) social science; 6 units literature.

Journalism with Emphasis on Public Relations and Advertising

Jour 8A-B, 109A-B, 110A-B, 114, 115	20
Jour 113, 145A-B, 145A-BF	11
Elect from: Jour 1, 2, 17A, 17B, 106, 117, 149, 150, 181	5
	36

Additional Requirements: IA 60; Psych 145; 6 units marketing.

Journalism with Emphasis on Radio and Television News Communication

Jour 8A-B, 109A-B, 110A-B, 114, 115	20
Jour 17A, 128	5
Elect from: Jour 1, 2, 17B, 108, 117, 126, 149, 150, 181	5
	30

Additional Requirements: R-TV 40, 41 or 44, 142, 147.

Journalism with Emphasis on Technical Writing and Editing

Jour 8A-B, 109A-B, 110A-B, 114, 115	20
Jour 106, 124, 126	8
IA 60	3
Electives in related areas approved by department chairman	12
	43

MINOR

News-Editorial	Units
Jour 8A-B, 109A, 110A, 114, 115	15
Journalism elective (3 ud)	5
	20

Journalism with Emphasis on Public Relations and Advertising

Jour 8A-B, 106, 113, 145A, 145AF	15
Journalism elective (3 ud)	5
	20

Journalism with Emphasis on Radio and Television News Communication

Jour 8A-B, 108, 128	12
Journalism electives (6 ud)	8
	20

Additional Requirements: R-TV 40, 41 or 44, 144.

CREDENTIAL PROGRAM

For information on the credential program consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

Courses

JOURNALISM

1. Introduction to Mass Communications (2)

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.

2. Interpreting the News (2)

Analysis, from the reader's point of view, of current information in news media; what constitutes news, breadth and depth of news coverage of various media, reliability of sources, influence of policy, methods of emphasis, objectivity and coloration.

8A-B. Reporting (3-3)

Prerequisite: Engl 1 or 3, sophomore standing. Preparation of varied stories used by newspapers; analysis of news sources; techniques of interviewing; problems encountered by reporters; ethical and legal considerations; coverage of some campus and community functions. (2 lecture, 2 lab hours)

17A. Introduction to Photography (2)

Not open to students with credit in Art 101. Still-photography; use of a variety of camera equipment for black-and-white pictures; pictures taken and films and prints processed in laboratory sessions. (1 lecture, 3 lab hours)

17B. Press Photography (2)

Prerequisite: Jour 17A or permission of instructor. Use of news cameras for photographic reporting; evaluation of pictures for publication; laboratory experience in use of flash and extension lighting, filters, and high-speed processing methods. (1 lecture, 3 lab hours)

102. The Press and World Affairs (3)

The role of the international press in collecting and disseminating national and foreign news.

104. Journalism in American Society (3)

Historical backgrounds of American press; development from colonial to modern times; newspapers and allied media as political and social forces.

106. Industrial Journalism (2)

Survey and analysis of internal and external publications produced by business and industry.

108. Reporting of Public Affairs (3)

Prerequisite: Jour 8A-B or permission of instructor. Methods of reporting the courts and municipal, county, state, and federal governments.

109A-B. Contemporary Problems of the American Press (2-2)

Prerequisite: Jour 8B or permission of instructor. Advanced reporting problems; handling news in depth; news policies and ethics; and specialized reporting.

110A-B. Advanced Reporting (3-3)

Not open to students with credit in Jour 109A-B prior to fall 1962. Prerequisite: Jour 8A-B; Jour 109A-B must be taken concurrently. Practice in handling advanced news writing and reporting assignments in the environment of a newsroom. College newspaper used as a laboratory. (8 hours arranged)

112. School Public Relations (2) (Same as A Ed 112)

Organization and analysis of a public relations program for elementary and secondary schools.

113. Public Relations (3)

Role of public relations in business and industry, education, and other fields; public relations programs and problems.

114. Editing of Publications (3)

Prerequisite: Jour 8A. Editing copy; writing headlines; using type effectively; handling telegraph copy; making up newspapers, trade and industrial publications, house organs and magazines. (2 lecture, 2 lab, 2 hours arranged)

115. Copyreading (1)

Reading copy and writing headlines. College newspaper used as a laboratory.

117. Advanced Press Photography (2)

Prerequisite: Jour 17B or permission of instructor. Field and laboratory work in the production of the picture story, magazine and advertising illustrations on assignment; advanced processing methods including use of color materials. (1 lecture, 3 lab hours)

124. Magazine Feature Writing (3) (Same as Engl 124)

Writing and marketing varied kinds of feature material used by magazines, Sunday newspaper supplements, and syndicates.

126. Interpretative Writing (3)

Critical analysis of structure and content of newspaper editorials; practice in writing editorials and interpretative articles; make-up of editorial pages; study of columns, cartoons, and special editorial features.

128. Radio and Television News Writing (3)
Prerequisite: Jour 8A or permission of instructor. Gathering and preparing news for broadcasting and telecasting; work with local stations.

131. Principles of High School Journalism (2)
Instruction in methods of advising and preparing high school newspapers and yearbooks.

132A-B. Yearbook Production (1-1)
Layout practice, writing of copy, and organization of yearbook. College annual used as a laboratory. (1 lecture, 1 hour arranged)

140. Introduction to Advertising (3) (See Mkt 140)

141. Advertising Production and Media (2) (See Mkt 141)

142. Radio and Television News Broadcasting (2) (See R-TV 142)

144. Advertising Campaigns (2) (See Mkt 144)

145A-B. Newspaper Advertising Procedures (2-2)
Newspaper advertising; management of advertising department, production of copy, layouts, and servicing accounts.

145A-BF. Field Work in Newspaper Advertising Procedures (2-2)
Practice in selling and servicing advertising accounts for newspapers with the college newspaper used as a laboratory. (2 lab, 2 field hours)

149. Public Opinion and Propaganda (3)
Use of propaganda to motivate public opinion on national and international levels in such areas as business, politics, and communities.

150. Media of Communication (3)
Motivation of large numbers of people through the control of such mass media as newspapers, magazines, motion pictures, radio and television.

181. Laws of Communication (2)
Libel, right of privacy, right of confidence, contempt by publications, property rights in manuscripts, infringement, copyright, postal laws.

190. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

198. Newspaper Practice (2-4; max total 4) Summer only
Prerequisite: permission of instructor. Internship on San Joaquin Valley newspapers and radio and television stations. Reports made regularly to instructor.

199. Newspaper Advertising Practice (2-4; max total 4) Summer only
Prerequisite: Jour 145A-B, 145A-BF; permission of instructor. Internship in advertising departments of San Joaquin Valley newspapers. Reports made regularly to instructor.

PHILOSOPHY DEPARTMENT

(In the Letters and Science Division)

Associate Professors: Colver, Uphold
Assistant Professors: Pitt (Chairman), Mathers, J. M. Smith
Part-time: Hahesy

The courses in philosophy seek to exhibit the role and function of philosophical principles and methods implicit in any discussion or field of learning which pursues its aim systematically. A critical appreciation of the utility of philosophy will aid the student to develop criteria by which to analyze and seek solutions of the problems of his age and civilization. The general prerequisite for all other philosophy courses is successful completion of Phil 3, or Engl 1, or an equivalent in composition. In special circumstances, students lacking the prerequisite may be admitted by permission of the instructor.

PHILOSOPHY MAJOR

	Units
Phil 10A-B	6
Elect from: Phil 102, 130, 140	6
Elect from: Phil 152, 153, 155	6
Elect from: Phil 162, 165, 183, 190, 192	6
Elective in philosophy (ud)	3
Elect from: Phil 5, 110, 111	3
	30

Note: Students intending to pursue graduate study in philosophy should seek the adviser's help in planning adequate preparation.

PHILOSOPHY-PSYCHOLOGY MAJOR

	Units
Psych 25, 66, 101, 102, 110, 118	18
Phil 10A-B, 165; 110 or Math 130	12
Elect from: Phil 102, 140, 141	3
Elect from: Phil 152, 153, 155, 162	3
Elect from: Anthro 2, 103, 104	3
	39

PHILOSOPHY MINOR

Elect from: Phil 102, 110, 111, 130, 140	3
Elect from: Phil 152, 153, 155	3
Elect from: Phil 162, 165, 183, 190, 192	3
Electives in philosophy	6
	15

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

Courses

PHILOSOPHY

1. Introduction to Philosophy (3)

Discussion of problems arising out of human conduct and the pursuit of knowledge.

3. Logic and Composition (3) (Same as Engl 3)

Phil (or Engl) 3 and Engl 4 constitute a year's sequence in composition; intended primarily for academic majors and other majors preparing for the professions. Meets general education requirement either in philosophy (if followed by Engl 4) or in written English (if followed by Engl 20). Prerequisite: passing grade on English entrance examination or equivalent; Psych 7 (preferably concurrently). An investigation of language, its uses in scientific contexts; elementary deductive logic; philosophical problems in formation and validation of scientific theories. Ten themes assigned on philosophical and cultural problems posed by the development of science.

5. Logic (3)

A study of the types of reasoning, both sound and fallacious, used in practical affairs and in the sciences.

10A-B. History of Philosophy (3-3)

(A) Ancient philosophy; development of scientific and philosophical thought in its social context from Thales to St. Augustine. (B) Medieval and modern philosophy; impact of the scientific revolution on development of philosophical systems from Descartes to Kant.

101. Contemporary Conflicts in Morals (3)

Philosophical basis for current views concerning individual morality, individual rights, use of violence, and other moral issues; readings selected from literary and journalistic, as well as philosophical and political sources.

102. Ethics (3)

Analysis and discussion of concepts in moral discourse; investigation of the nature of moral reasoning and of claims to moral knowledge.

110. Symbolic Logic I (3) (Same as Math 110)

Prerequisite: Phil 3, Math 3, or permission of instructor. Rigorous development of deduction; sentential logic, a natural deduction system for the predicate logic; definition of systematic consistency and completeness; proofs of invalidity, consistency, and independence of sentences within predicate logic.

111. Symbolic Logic II (3) (Same as Math 111)

Prerequisite: Phil 110 or permission of instructor. Continuation of Phil 110. Logic of relations and identity; reduction to normal forms; formalization of informal proofs; formal definition of theoretical concepts and axiomatization of scientific theories.

130. Aesthetics (3)

Philosophy of criticism: analysis of problems involved in talking about the arts, and of theories of interpretation and evaluation of the arts, such as music, painting, literature.

140. Philosophy of Religion (3)

Prerequisite: 3 units of philosophy. Theories of religious knowledge, religious values, the concept of God, and the problem of evil.

141. Comparative Religions (3)

Analysis and comparison of answers to basic philosophical questions raised by Hinduism, Buddhism, Taoism, Confucianism, Shinto, Zoroastrianism, Mohammedanism, Judaism, and Christianity.

152. Ancient Philosophy (3; max total 6)

Intensive study of the writings of a philosopher or philosophers: the pre-Socratics, Plato, Aristotle, Hellenistic philosophy, Plotinus.

153. Medieval and Modern Philosophy (3; max total 6)

Intensive study of the writings of a philosopher or philosophers: scholastic philosophy, Hobbes, Descartes, Spinoza, Locke, Leibniz, Berkeley, Hume, Kant.

155. Twentieth Century Philosophy (3; max total 6)

Intensive study of an influential philosopher or philosophical movement of this century.

162. Metaphysics and Theory of Knowledge (3)

An inquiry into the nature of reality, and an evaluation of our methods of knowing it; concepts traditional to such a study include Being, freedom, perception, and memory.

165. Philosophy of Science (3)

Prerequisite: 9 units of science. Assumptions and methods of scientific inquiry—law, causality, verification, scientific explanation; relation of these concepts to other branches of philosophy.

183. Living Philosophies in World Literature (3) (See Engl 183)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

192. Theory of Language (3) (Same as Engl 192)

The study of language viewed as containing the origin and the solution of philosophical disputes.

199. Great Books (1-3; max total 6)

May not apply on philosophy major. Prerequisite: permission of instructor. Independent reading of selected great books in the sciences and the humanities; discussion with interdepartmental faculty group.

GRADUATE COURSE

(See *Course Numbering System—Definitions and Eligibility*)

200. Foundations of Mathematics (3) (See Math 200)

POLITICAL SCIENCE DEPARTMENT
(In the Letters and Science Division)

Associate Professors: Buckman (Chairman), Svenson
Assistant Professors: Cate, Provost, F. Wright

The Political Science Department offers courses leading to a bachelor of arts degree with a major or minor in political science or public administration and offers graduate courses to provide a political science concentration for the master of arts degree in social science. In addition to curricula designed to prepare students for careers in teaching, government or related fields, the department offers courses for the non-major to meet the general education requirements and provide insight into the field of politics for the general student concerned with his role as a citizen in a democracy.

FOREIGN LANGUAGE REQUIREMENT

Majors in political science are required to complete satisfactorily four semesters of college work (or its equivalent) in a modern foreign language. Departmental waivers of this requirement may be granted only in exceptional circumstances.

UNITED STATES CONSTITUTION REQUIREMENT

The United States Constitution (including California state constitution and local government) requirement for graduation should be fulfilled by Pol Sc 11 or Pol Sc 1A-B or 101.

MAJORS

The following major requirements are in addition to the general education requirement in social science.

Political Science	*Units*
Pol Sc 1A-B, 112A, 112B or 114, 127	15
Elect from: Pol Sc 126, 128, 132, 136	3
Elect from: Pol Sc 135, 141, 142, 144, 146	9
Elect from: Pol Sc 124, 129, 152, 153, 156, 157, 161, 163, 164A-B	3
Elect from: Econ 178, 180; Hist 137, 138, 151, 152, 167, 176; Soc 111	6
	36

Public Administration	
Pol Sc 1A-B, 112A or B, 164A-B	15
Elect from: Pol Sc 127, 144, 146	6
Elect from: Pol Sc 152, 161, 163, 165, 170	9
Elect from: Econ 131A, 180; Bus Ad 102; Soc 152, 155	6
	36

MINORS

The following minor requirements are in addition to the general education requirement in social science.

Political Science	*Units*
Pol Sc 1A-B; 112A or B or 114	9
Elect from: Pol Sc 127, 128, 132	3
Elect from: Pol Sc 135, 136, 141, 142, 144, 146	6
Elect from: Pol Sc 152, 157, 164A-B	3
Elect from: Econ 178, 180; Hist 137, 138, 151, 152, 167, 176; Soc 111	3
	24

Public Administration	
Pol Sc 1A-B; 112A or B; 164A-B	15
Elect from: Pol Sc 161, 163, 165, 170	6
Elect from: Econ 131A; Bus Ad 102; Soc 152	3
	24

CERTIFICATE IN PUBLIC ADMINISTRATION

The certificate in public administration is offered to persons interested in training for work in public service. Applications for admission to the program must be approved by the Political Science Department. The certificate in public administration is granted upon completion of an approved program of 23 units with a grade-point average of 2.5 (on a four grade-point system). For information on course requirements, consult the department adviser.

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

Courses

POLITICAL SCIENCE

1A-B. Comparative Government (3-3)

Full-year sequence meets the United States Constitution and California state and local government requirement for general education. Essentials and comparative features of major governments of the world. (A) Government and politics of Great Britain, France, and Russia. (B) Politics and government of Switzerland, and the United States; federal, California state and local government relationships.

11. American Government and Institutions (3) (Former Soc Sc 3B)

Meets the United States Constitution requirement for general education; federal, California state and local government. Not open to freshmen or to students with credit in Pol Sc 1A-B or 101. Prerequisite: Hist 10 or equivalent. Government within the context of society; relevant studies in economics, sociology, anthropology, history, psychology organized around a set of governmental questions.

101. American Constitution, Institutions and Ideals (3)

Meets the United States Constitution requirement for general education. Not open to students below second semester sophomore or with credit in Pol Sc 1A-B, 11, or equivalent. Prerequisite: Hist 8A-B, 10, or permission of instructor. Executive, legislative, and judicial functions of our government under the constitution; federal, California state and local governmental relationships.

102. California Government and Institutions (1)

Not open to students with credit in Pol Sc 1A-B, 11, 101, or equivalent. 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.

112A-B. History of Political Thought (3-3)

Pol Sc 112A is not prerequisite to 112B. Prerequisite: Pol Sc 1A-B or permission of instructor. (A) Development of political thought from Plato to Machiavelli with readings and discussions. (B) Development of political thought from Machiavelli to the present.

114. American Political Thought (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Development of American political philosophy from its European foundation to the present; geographic,

economic, social and cultural influences on American political ideas; effect on governmental policies and political institutions.

124. Foundations of National Power (2)

Not open to students with credit in Air Sc 104A. Prerequisite: upper division standing; AFROTC students register under Air Sc 104A. Major factors underlying international tensions—nationalism, imperialism, and communism; attempts to alleviate these tensions; balance of power concepts; the superpowers United States and the USSR.

127. International Relations (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Analytical introduction to international relations; nationalism; imperialism; racial, population, and economic factors; war; settlement of international disputes by methods other than war; foreign policies of the major powers.

128. Contemporary World Politics, 1914 to the Present (3)

Prerequisite: Pol Sc 1A-B, Hist 4A-B, or permission of instructor. World affairs from 1914 to the present; present foreign policies of the major powers from historical, political, and economic viewpoints; events leading to World War II and United Nations organization.

129. Contemporary International Problems (1)

Prerequisite: Pol Sc 1A-B, upper division standing, permission of instructor. Reading, research, and discussion of current international problems.

132. The Conduct of American Foreign Affairs (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Formulation and execution of foreign policy; constitutional framework; role of the President and the executive branch, Congress, pressure groups and public opinion; contemporary problems and policies.

135. Soviet Institutions (3)

Prerequisite: Pol Sc 1A-B, Hist 137, 138, or permission of instructor. The Soviet State since 1918; political aspects of Soviet institutions.

136. Soviet Foreign Policy (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Sources of Soviet foreign policy, historical and ideological; purposes and policies for formulation; *cold war* policies and practices, attitudes toward East-West tensions, colonialism, underdeveloped areas, neutralism, disarmament; contest for power with red China; current trends.

141. Governments of the Commonwealth (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Commonwealth system and the nations composing it; Australia, New Zealand, Canada, and India; role of emerging nations within the system.

144. The Government of England (3)

Prerequisite: Pol Sc 1A or permission of instructor. Constitutional history since 1900, contemporary political parties, and governmental machinery of the United Kingdom.

146. Latin-American Governments (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Political evolution of the foremost Latin-American republics; racial, cultural, economic, and geographic factors; constitutional history and development of political institutions and parties.

152. Political Parties and Pressure Groups (3)

Prerequisite: Pol Sc 1A-B or Hist 8A-B; permission of instructor. History and characteristics of political parties and pressure groups; their interaction and influence upon nominations, and elections, upon executive and legislative branches of federal, state, and local government.

153. Dynamics of Political Behavior (2)

Prerequisite: Pol Sc 1A-B, permission of instructor. Recent statistical and other techniques for the analysis of political behavior.

156. American Governmental Process (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Contemporary problems and issues of American government.

157. United States Constitution: Growth and Development in Theory and Practice (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Law of the Constitution and its underlying political theory, with leading cases.

161. State and County Government (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. The organization, structure, powers, and functions of state and county governments.

163. Municipal Government and Administration (2)

Prerequisite: Pol Sc 1A-B or permission of instructor. 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.

164A-B. Public Administration (3-3)

Prerequisite: Pol Sc 1A-B or permission of instructor. (A) Administrative organization; structures; span of control and staff and line functions; the federal system; relation of executive to other branches of government; administrative reorganization in the United States. (B) Administrative procedure; internal management; personnel; fiscal management; administrative tribunals.

165. Public Personnel Administration (2)

Prerequisite: Pol Sc 1A-B, 164A-B; or permission of instructor. American personnel administration; job recruitment and classification; merit test construction and analysis; salary plans and grades; building employee morale and efficiency, on-job training programs; promotions, demotions, dismissals, retirement programs.

170. Introduction to Planning (2)

Prerequisite: Pol Sc 1A-B or permission of instructor. Planning process in government and role of the planner in a democratic society; planning as a line of function in city, county, and area government; planning boards and commissions.

172. Urban Renewal and Metropolitan Problems (2; max total 4)

Limited to students who can arrange field trips. Prerequisite: Pol Sc 1A-B, or 101, or permission of instructor. Administration of urban renewal programs in cities and counties; concept of the workable program and other requirements for federal aid; problems of intergovernmental cooperation in local and metropolitan areas, housing, planning, and redevelopment programs.

180. Internship in Public Administration (2-6; max total 6)

Prerequisite: Pol Sc 1A-B and permission of instructor. Supervised work and project experience with government agencies; government problems and procedures. (1 weekly seminar; minimum of 3 field hours per unit)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

249. Seminar in Comparative Government (3; max total 6)

Prerequisite: Pol Sc 1A-B, 127, and permission of instructor. Advanced level synthesis of basic concepts, issues, and problems of comparative government.

264. Seminar in Public Administration (3; max total 6 if topic not repeated)

Prerequisite: permission of instructor. Problems in administrative analysis and organization, tools and techniques of administrative research, interpretation and application of research findings.

280. Seminar in Social Science (3; max total 6)

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis (2-4; max total 4)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

SOCIAL SCIENCE

(In the Letters and Science Division)

A major in social science is offered for the bachelor of arts degree. This major meets the requirements for a diversified/interdepartmental major for a standard teaching credential. The master of arts degree is also offered in the field of social science. Since there is no social science department, students following these programs will be assigned to a faculty adviser in one of the following departments: Anthropology-Sociology, Economics, Geography (in Physical Science Division), History, Political Science. While a foreign language is not required of the bachelor of arts degree major in social science, students who intend to work toward the master of arts degree in social science are advised to complete two years of an acceptable foreign language while in undergraduate study.

SOCIAL SCIENCE MAJOR

The following requirements are in addition to the general education requirements in social science.

	Units
Econ 1A	3
Geog 3 or 4	3
Hist 1, 2	6
Soc 1A or Anthro 2	3
From ud Anthro-Soc, Econ, *Geog, Hist, Pol Sc:	
Elect in one department	15
Elect in other departments	9
	39

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in social science is based on the equivalent of the undergraduate major at Fresno State College. The program consists of courses from the various fields in the social sciences. For specific requirements, consult the chairman of the graduate committee for the social sciences; for general requirements, see *Degrees and Credentials—Master's Degrees.*

FOREIGN LANGUAGE REQUIREMENT

Advancement to candidacy for the master of arts degree with a major in social science requires the passing of an examination demonstrating the ability to read materials of the major in one appropriate foreign language.

* May not include Geog 5, 6, 108, 111, 112, 115, 130, 180, 181.

SOCIAL WORK DEPARTMENT

(In the Letters and Science Division)

Associate Professor: Brigham (Chairman)
Assistant Professors: P. Pickford, W. Rich
Additional Staff—Fall 1964.

The Social Work Department provides an undergraduate major in social welfare leading to the bachelor of arts degree, designed to provide preparation for graduate work, to prepare for beginning positions in social work, and to provide a broad education in liberal arts. The department offers a two-year graduate program of preparation leading to the professional master of social work degree.

Social welfare courses at the undergraduate level include integration of theoretical and applied materials with contributions from sociology, political science, cultural anthropology, economics, and psychology. Graduate social work courses are similarly integrated and include materials from medicine, psychiatry, and law, as well. Additionally, graduate social work courses include content unique to social work, especially in methods, field instruction, and social welfare policy and services.

COOPERATING AGENCIES

Several social agencies in the central San Joaquin Valley participate in the social welfare and social work training program by providing field experience and instruction at the undergraduate and graduate level. These include the North Avenue Community Center, Valley Children's Hospital Child Guidance Clinic, Fresno County Department of Public Welfare, Porterville State Hospital (Social Service Division), Kings County Schools, Bureau of Social Work of the State Department of Mental Hygiene, and Social Service Division of the United States Veterans' Administration Hospital. In addition, other agencies cooperate in the program.

BACHELOR OF ARTS DEGREE MAJOR IN SOCIAL WELFARE

	Units
Econ 1A-B, Anthro 2, Soc 1A	12
S Welf 120, 121, 122, 124, 126, 181	14
Elect from: Anthro 104, Econ 150, Soc 152, 155, 157, S Welf 125, 127, 128	6
Elect from: Crim 120, 132, Econ 180, Mkt 105, Soc 111, 140	3
Elect from: Econ 131A-B, Pol Sc 161, 163, 164A-B	3
	38

(In addition, psychology minor for social welfare required.)

FOREIGN LANGUAGE REQUIREMENT

Two years of satisfactory collegiate study (or equivalent) of one modern foreign language are required for all majors in social welfare. The language recommended as most useful for practice in the western hemisphere is Spanish. Oral use of language is emphasized.

MASTER OF SOCIAL WORK DEGREE

The master of social work degree prepares social workers for such areas as public assistance, child welfare, hospital social service, family service, child guidance, mental health, overseas social work, rehabilitative social work, social work in correctional programs. Emphasis at Fresno State College is on generic training of social workers rather than on specialization.

The graduate program requires two years of full-time enrollment. Eligibility for admission to the program is based on completion of a bachelor's degree, preferably in a social welfare major or with substantial preparation in the social sciences

and psychology (although other patterns may be permitted); an acceptable score on the Graduate Record Examination Aptitude Test; specified grade point average at the undergraduate level; and academic and personal suitability for the field as determined by social work faculty.

The program includes both classroom study and closely supervised field instruction. Emphasis will be upon social casework with some orientation to social group work, community organization, and administration. All degree students will be required to complete an individual thesis or a group research project.

For further information, consult the department chairman. For general requirements see *Degrees and Credentials—Masters Degrees.*

SEQUENCE OF GRADUATE COURSES FOR MASTER OF SOCIAL WORK DEGREE

1st Semester (15-16 un): SW 200, 220, 230, 250 (4 un); approved elective (2-3 un).
2nd Semester (15 un): SW 201, 221, 230, 250 (4 un), 291.
3rd Semester (14 un): SW 222, 230, 250 (6 un), 297 or 299 (2 un); optional approved elective.
4th Semester (14 un): SW 202, 230, 250 (6 un), 297 or 299 (2 un); optional approved elective.

Courses

SOCIAL WELFARE

120. Introduction to Social Welfare (2)

Prerequisite: Soc 1A or permission of instructor. History and philosophy of social welfare and social work in Europe and the United States.

121. Social Welfare Programs (2)

Prerequisite: Soc 1A or permission of instructor. Major contemporary social welfare programs in the United States.

122. Child Welfare (3)

Prerequisite: Soc 1A or permission of instructor. Recommended: Psych 119, S Welf 120, 121. Programs for physical, psychological, and social needs of children; institutions, foster homes, adoption, guidance clinics, protective and preventive services, services for handicapped; legislation.

124. Fundamentals of Interviewing (3)

Prerequisite: Soc 1A or permission of instructor. For social welfare, criminology, recreation, and education students. Principles and practice of interviewing in case work, group work, community organization, social research, correctional work, and related areas.

125. Survey of Social Work Methods (2)

Prerequisite: Soc 1A or permission of instructor. Concepts and practices of social welfare methods; case work, group work and community organization; analysis of material from the field.

126. Social Security Principles (2)

Prerequisite: Soc 1A or permission of instructor. Basic philosophy and policy of social security programs, including public assistance and social insurances; the Social Security Act; roles of federal, state, and local governments.

127. Community Welfare Organization (3)

Prerequisite: Soc 1A or permission of instructor. Community mental health, medical, recreation, informal education, and welfare resources; organization and coordination of community services to meet social needs.

128. Principles of Group Work (2)

Prerequisite: Soc 1A or permission of instructor. For social welfare, criminology, recreation, education students, and others interested in group work. Fundamentals of group process, group dynamics, and group therapy; guided group experience.

180. Training in Public Service (1-2; max total 5)

Prerequisite: Soc 1A or permission of instructor. Planned and supervised experience or study in a field of occupational specialization.

181. Supervised Social Welfare Field Experience (1-2; max total 4)

Prerequisite: second semester junior standing; Soc 1A or permission of instructor. Observation, orientation and limited participation in operations of private or public social welfare agencies. (Minimum of 3 field hours per unit.)

SOCIAL WORK

GRADUATE COURSES

200. Social Welfare Policy and Services I (3)

Prerequisite: admission to MSW program. Social work philosophy, values and ethics; the evolving, changing relationship of social work and social welfare to changing socio-economic and political climate; social welfare as a social institution evolving from aspects of social change and social responsibility.

201. Social Welfare Policy and Services II (3)

Prerequisite: SW 200. Further development and expansion of social welfare as a social institution concerned with the social functioning of a changing society; law in relation to social policy, services and administration; current policy and services.

202. Social Welfare Policy and Services III (3)

Prerequisite: SW 201. Current social welfare policy and services; a comparative evaluation of United States and other world programs, policy and expectations with emphasis on philosophy, values and ethics; current social issues in relation to social function and social responsibility.

220. Human Growth and Social Functioning I (3)

Prerequisite: admission to MSW program. Development and social functioning of the individual from prenatal period through old age; emphasis on understanding native endowment and environmental factors as sources of growth and potential for social functioning.

221. Human Growth and Social Functioning II (3)

Prerequisite: admission to MSW program. Interaction of endowment with environmental forces in adaptive functioning of individuals and groups in response to stress and change; health and disease factors, role and cultural factors and group processes as supports or deterrents to adequate social functioning.

222. Human Growth and Social Functioning III (3)

Prerequisite: admission to MSW program. Development of a theoretical framework for assessment of human potential for social functioning individually and in groups; analysis of case material.

230. Social Work Methods (3; max total 12)

Prerequisite: admission to MSW program. To be taken four semesters in sequence (2 units casework and 1 unit in area indicated each semester): first semester, introductory social casework and introductory social group work; second se-

mester, social casework and social group work; third semester, advanced social casework and introductory community organization; fourth semester, integrative social casework and introductory administration.

250. Field Instruction (4-6; max total 20)

Prerequisite: admission to MSW program. Placement in a social agency for supervised progressive field practice: first and second semester (4 units each), two days a week; third and fourth semester (6 units each), three days a week.

272. Social Work in Rural Areas (2)

Prerequisite: admission to MSW program; permission of chairman. The social worker's function with wide ranging problems and limited resources; problems of farm laborers, small farmers, isolation; utilization of appropriate techniques and methods.

273. Seminar in Correctional Social Work (2)

Prerequisite: permission of chairman. Use of social work in the correctional field; programs, problems, analysis of extension of social work services in corrections.

274. Services for the Aging (2)

Prerequisite: admission to MSW program; permission of chairman. Consideration of needs in areas of income maintenance, health, living situation, and leisure time satisfaction of the aging; programs to meet these needs.

275. International Social Work (2)

Prerequisite: admission to MSW program; permission of chairman. Problems and practices of social work outside of North America with particular emphasis on the application of social work knowledge, skills and practices in the developing parts of the world.

279. Community Development (2)

Prerequisite: permission of chairman. Introduction to the concept of local self-help with aid of an outside agent; defining problems, assessing potential, techniques of involving local people to assume responsibility, use of appropriate technical or specialized assistance.

280. Social Work Supervision (2)

Prerequisite: permission of chairman. Introduction to supervision in social work as an administrative and educational function; role of supervisor as transmission agent between staff and executive board; objectives of supervision; creative leadership; staff development; evaluation.

281. Seminar in Group Services (2)

Prerequisite: permission of chairman. Use of the group approach in traditional group-serving programs and in agencies or programs which are not primarily group-serving; recreational, informal educational, therapeutic, family service, children's services, correctional, and other settings.

285. Financing of Social Welfare Programs (2)

Prerequisite: permission of chairman. Public and private agency financing; long-term and short-term budgeting; single and intergovernmental programs; independent and federated funding of voluntary agencies.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

291. Social Work Research Methods (2)

Prerequisite: elementary statistics. Introduction to the scientific method in social work research; consideration of the value and necessity for research in social work; research question formulation, design, techniques, data collection, interpretation.

297. Group Research Project (2-4; max total 4)

Prerequisite: SW 291. Utilization of social work research principles and techniques to select study design, determine data collection techniques, collect and process data, interpret findings and prepare final written report. Work on group basis, standards same as thesis.

299. Thesis or Project (2-4; max total 4)

Prerequisite: SW 291. See *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

LIFE SCIENCE DIVISION

Division Head ..... Lloyd G. Ingles

Department	*Chairman*
Biology	Lloyd G. Ingles
Nursing	Fannie L. Gardner
Psychology	Edward V. Tenney

The Life Science Division provides basic training in those disciplines concerned with the organic world and animal and human behavior. This includes experiences in fundamental techniques in the manipulation of equipment; familiarization with problems, facts, theories, and principles in the life sciences; methods employed in problem solving; and experiments with mental processes, methods of testing and measuring personality, clinical procedures and evaluations, and group dynamics.

The division offers majors and minors for the bachelor of arts degree and bachelor of science degree; master of arts degree majors in biology and in psychology; and preprofessional preparation in related fields.

Biology 224
- Bacteriology
- Biology
- Botany
- Entomology
- Physiology
- Zoology

Nursing 234

Psychology 237

BIOLOGY DEPARTMENT

(In the Life Science Division)

Professors: Ingles (Chairman), D. Falk, Hadsall, Hawbecker, McCoy, Rees
Associate Professors: Arce, J. Carr, McClintic, P. Smith, Staebler, Woodwick
Assistant Professors: Burdick, Daubs, R. L. Evans, Latimer, Standing, Weiler
Lecturer: Gross
Part-time: Blake, Crossman, Harris, Isaak, McHenry, Potter, Singh, Toffoli

The Biology Department includes the following fields: bacteriology, biology, botany, entomology, physiology, and zoology. Courses in each of these fields may be found under these headings. Courses are provided for general students, for those who are training for vocational and preprofessional work in biological fields, for students planning to become teachers, and for those who plan to enter the biological services of government agencies.

In addition to the general education offerings, the department offers majors and minors for the bachelor of arts degree; the bachelor of science degree; and the master of arts degree.

PREPROFESSIONAL PREPARATION

For preprofessional program in dentistry and medicine, see *Preprofessional Preparation* section following *Degrees and Credentials.*

FOREIGN LANGUAGE REQUIREMENT

Two years of satisfactory collegiate study (or equivalent) in one foreign language are required for the bachelor of arts degree majors in biology, botany, life sciences, microbiology, and zoology. See the general statement under *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

BACHELOR OF ARTS DEGREE MAJORS

The Biology Department offers majors for the bachelor of arts degree in biology, botany, life sciences, microbiology, and zoology for students planning to enter graduate schools and research, professional schools, and biological field work. These majors consist of 31 to 40 units of which 24 must be upper division. Students must be reasonably prepared in physics, inorganic, and organic chemistry.

See bachelor of science degree in biology.

Biology Major for BA	*Units*
Bot 1 or equivalent	3–5
Zool 1 or equivalent	3–5
Biol 120 or 151	3
Field course in biological science	3
Biological science electives (incl 8 units each in plant and animal science)	24–28
	40

Additional Requirements: 12 units physical science including chemistry and physics. (Recommended: Chem 2A-B, 8, 109; Physics 2A-B; Geol 1.) See foreign language requirement.

Botany Major for BA	*Units*
Bot 1, 104, 106, 107, 134, 135, 136	27
Biol 120 or 151	3
Biological science electives	6
	36

Additional Requirements: Zool 1; Chem 1A or 2A-B; Physics 2A-B or Phy Sc 10. Recommended (one or more of the following): Ag 130, 136; OH 3. See foreign language requirement. Students with fewer than 4 units of general zoology must take an upper division course in zoology.

Life Sciences Major for BA	*Units*
Physio 1 or 170; and one course from Bot 104, 134, 135, 136 (4 ud)	7–8
Elect from: Bact 20, 54, Chem 150A	4–5
Elect from: Biol 112, 157, 208, Bot 107, Ent 101, Zool 108, 113, 134, 135, 137, 138, 140, 165	6–8
Biol 120 or 151; 162	6
Elect from: Biol 120L, Bot 135, 136, Zool 160, 164, 175	2–5
Elect from courses in taxonomy, history, current biological problems (6 ud)	6–8
	31–39

Additional Requirements: Chemistry (incl. organic), 8–9 un; Physics 2A-B, or Phy Sc 10 and 3 un physics elective; Math B, C, 40 or equivalent. See foreign language requirement.

Microbiology Major for BA	*Units*
Bact 54, 117, 118, 161, 185, 185L	22
Chem 28, 109, 128	9
Biological science electives from: Bact 130, 151; Ent 107, 107L; Zool 108, 114	6
	37

Additional Requirements: Biol 1A or Bot 1; Chem 1A-B, 105; Physics 2A-B. See foreign language requirement.

Zoology Major for BA	*Units*
Bot 1, Zool 1, 160, 164; Zool 114 or Ent 101	21
Biol 120 or 151	3
Approved biological science electives (at least 6 units animal science)	12
	36

Additional Requirements: at least 8 units chemistry, 6 physics, 3 statistics. See foreign language requirement. Students with fewer than 4 units of general botany must take an upper division course in botany.

BACHELOR OF SCIENCE DEGREE

The bachelor of science degree in biology is offered for students preparing for careers such as medical technologist and bacteriologist. This degree requires a total of 128 units. The general degree regulations and general education requirements must also be fulfilled.

Biology Major for BS	*Units*
Bact 54, 117, 118, 185, 185L	18
Physio 1, Biol 116	7
Zool 1, 108, 157, 158	16
	41

Additional Requirements: Biol 1A; Chem 2A-B, 8, 105, 109, 150A-B.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF ARTS DEGREE MAJORS

In addition to the specific courses listed below, general education requirements and electives should be included to bring total to 15-17 units per semester. A total of 124 units must be completed for the bachelor of arts degree. Electives may include minor and credential requirements. (See *Degrees and Credentials.*)

Biology

1st Year: Chem 2A-B, Bot 1, F Lang
2nd Year: Physics 2A, Zool 1, F Lang
(Recommended: Geol 1, Chem 8, Physics 2B)
3rd & 4th Years:
Biol 120 or 151; complete major requirements
(Recommended: Chem 109)

Botany

1st Year: Bot 1, Zool 1, Chem 1A or 2A-B, F Lang
2nd Year: Physics 2A-B or Phy Sc 10, F Lang
3rd & 4th Years:
Bot 104, 106, 107, 134, 135, 136, Biol 120 or 151, Biol Sc electives

Life Sciences

Consult departmental advisers for suggested sequence.

Microbiology

1st Year: Bot 1 or Biol 1A, Chem 1A-B, F Lang
2nd Year: Bact 54, Chem 28, 109, 128, F Lang, Physics 2A-B
3rd & 4th Years:
Bact 117, 118, 161, 185, 185L, Chem 105, Biol Sc major electives

Zoology

1st Year: Zool 1, Chem 1A or 2A-B
2nd Year: Bot 1, Physics 2A-B, Chem 8, Biol 120 or 151, F Lang
3rd & 4th Years:
Major electives (animal), Ent 101 or Zool 114, F Lang, statistics, Zool 160, 164

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE MAJORS

In addition to the specific courses listed below, general education requirements and electives should be included to bring total to 15-17 units per semester. A total of 128 units must be completed for the bachelor of science degree. (See *Degrees and Credentials.*)

Biology

1st Year: Zool 1, Physio 1, Biol 1A, Chem 2A-B
2nd Year: Bact 54, Zool 108, Chem 8, 109
3rd & 4th Years:
Bact 117, 118, 185, 185L, Zool 157, 158, Biol 116, Chem 105, 150A-B

BIOLOGY MINOR

The biology minor consists of 20 units of which 6 must be upper division.

	Units
Biol 1A-B or 2A-B	6
Biol 112 or an approved field course	3
Biological science elective (3 units u.d.)	11
	20

Additional Requirements: physical science including chemistry and physics. (Recommended: high school chemistry or Chem 2A-B; high school physics or Phy Sc 10.)

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in biology is based on the equivalent of a Fresno State College undergraduate major in biology, botany, life sciences, microbiology, or zoology. Eighteen of the 30 units required for the degree must be in biological science and must include Biol 200 or 206. For specific requirements consult the department graduate adviser; for general requirements, see *Degrees and Credentials—Master's Degrees.*

FOREIGN LANGUAGE REQUIREMENT

Advancement to candidacy for the master of arts degree with a major in biology requires the passing of an examination demonstrating the ability to read materials of the major in one appropriate foreign language.

Courses

BACTERIOLOGY

20. General Microbiology (4)

Not open to students with credit in Bact 54. Not applicable for credit on botany or microbiology major; or the biology major for bachelor of science degree. Prerequisite: Chem 2A-B; one of the following—Biol 1A, 2A-B, Bot 1 or Physio 1. General survey of the field of microbiology; principles and selected practical applications. (2 lecture, 6 lab hours)

54. Bacteriology (5)

For majors. Prerequisite: organic chemistry; Biol 1A or Bot 1. Morphological and physiological consideration of the Schizomycetes and selected unicellular Eumycetes; techniques, illustration of principles, and determinative bacteriology in the laboratory. (3 lecture, 6 lab hours)

117. Serology and Immunology (4)

Prerequisite: Bact 54, Chem 8. Principles and applications of plasma changes in presence of antigens. (2 lecture, 6 lab hours)

118. Bacteriology of Human Disease (5)

Prerequisite: Bact 54, 117, Chem 8. Bacterial, mycotic and viral etiological agents of human disease. (3 lecture, 6 lab hours)

130. Plant Pathology (4) (See Ag 130)

151. Dairy Bacteriology (3) (See DS 151)

161. Microbial Physiology (4)

Prerequisite: Bact 54. Structure and physiological functions in the bacterial cell. (2 lecture, 6 lab hours)

185. Virology (2)

Prerequisite: permission of instructor. Biological and chemical aspects of viruses.

185L. Virology Laboratory (2)

Prerequisite or concurrently: Bact 185. Techniques of viral cultivation, detection, and assay; illustration of principles. (6 lab hours)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

BIOLOGY

1A. Plant Biology (3)

Not open to students with credit in Biol 2A-B or Bot 1. Structure, function, ecology, and economic study of plants including heredity and evolution. (2 lecture, 2 lab. hours)

1B. Animal Biology (3)

Not open to students with credit in Biol 2A-B or Zool 1. Structure, function, ecology and economic study of animals; physiology as applied to man. (2 lecture, 2 lab hours)

2A. Life Science (3)

Not open to students with credit in Biol 1A, 1B, Bot 1 or Zool 1. Principles of biology related to the cell, maintenance, and relation of living organisms, heredity and elementary processes of evolution. (2 lecture, 2 lab hours)

2B. Life Science (3)

Prerequisite: Biol 2A. Principles of biology related to reproduction, mechanisms of evolution, diversity of life, populations and communities, biogeography, history of life. (2 lecture, 2 lab hours)

66. General Human Anatomy (3)

For general students. Recommended: Physio 1 or Biol 1B. Structure of the human body. (2 lecture, 3 lab hours)

101. Nature Study (2)

Concurrently with Biol 102. Prerequisite: 9 units of natural science including a general biology, botany, or zoology course. Choice and development of natural science materials for elementary schools.

102. Nature Study Laboratory (1)

Concurrently with Biol 101. Problems and projects for elementary school. (3 lab or field hours)

112. Field Biology (3)

Not open to students with credit in more than two field courses in the Biology Department. Prerequisite: Biol 1A-B, 2A-B or equivalent. Local environmental and biotic interdependencies. (2 lecture, 3 lab or field hours)

116. Microscopic Technique (3)

Prerequisite: one of the following—Biol 1A, 1B, Zool 1, Bot 1. Preparation of plant and animal tissues for microscopic study. (9 lab hours)

120. Genetics (3)

Prerequisite: one of the following—Biol 1A, 1B, 2A-B, or equivalent. Principles of biological inheritance.

120L. Genetics Laboratory (2)

Prerequisite or concurrently: Biol 120. Experimental studies on inheritance in Drosophila, Maize, and Neurospora. (6 lab hours)

149. Elementary Science for Teachers in Service (3)

Prerequisite: permission of instructor. The development of an elementary science unit under supervision. (2 lecture, 3 lab hours)

151. Heredity and Evolution (3)

Not open to students with credit in Zool 175 or Biol 120. Prerequisite: Biol 1B, 2A-B or equivalent. Heredity of man and principles of organic change.

157. Conservation of Natural Resources (3) (Same as E 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.

162. Biological Techniques (3)

Prerequisite: upper division in biology, permission of instructor. Collection and preparation of biological materials and specimens for secondary schools. (9 lab or field hours)

173. Great Men of Science (2)

Prerequisite: one of the following—Biol 1A-B, 2A-B, Zool 1, Bot 1. Men from all fields of science and their contributions.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200. Principles and Great Experiments in Biology (2)

Development and influence of current biological thought.

204. Biology of Speciation (2)

Prerequisite: major in the Biology Department, Biol 120, and a field course. Evolution as a process with emphasis on evolutionary mechanisms in plants.

206. Principles of Taxonomy (2)

Zoological nomenclature and related fields.

208. Field Work in Biology (1-6; max total 6)

Prerequisite: upper division course in specialized area; permission of instructor. Botanical and zoological field studies.

220. Insect Toxicology (3)

Prerequisite: Ent 101, Chem 8. Mode of action of insecticides and other toxicants in insects and other animals; physical and chemical properties. (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)

250. Scientific Research Reporting (2)
Prerequisite: Zool 1, Bot 1, or equivalent. Techniques of scientific drawing and writing. (1 lecture, 3 lab hours)

255. Topics in Botany (2; max total 6)
Prerequisite: upper division botany course appropriate to study topic; permission of instructor. Investigation of selected areas in the field of botany.

259. Experimental Infectious Pathology (3)
Prerequisite: Bact 118, Biol 116, Zool 157 or permission of instructor. The production and study of tissue changes resulting from infection with pathogenic microorganisms.

260. Topics in Microbiology (2; max total 6)
Prerequisite: Bact 20 or 54 and one upper division science course; permission of instructor. Intensive investigation of selected areas in microbiology.

265. Topics in Physiology (2; max total 6)
Prerequisite: Physio 170 or upper division science course; permission of instructor. Investigation of selected areas in the field of physiology.

270. Topics in Zoology (2; max total 6)
Prerequisite: upper division zoology course appropriate to study topic; permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area; topics may include animal behavior, taxonomic methodology, taxonomy of immature insects, experimental embryology.

281. Seminar in Biological Science (1; max see below)
Maximum total credit 5 units; not more than 2 units in each field. Prerequisite: one of the majors in the Biology Department. Reviews and reports on recent literature and problems in biology, botany, entomology, microbiology, and zoology.

290. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

299. Thesis (2-4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

302. 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.

BOTANY

1. General Botany (5)
For majors and preprofessional students. Prerequisite to most upper division botany courses. Fundamentals of structure and function in seed plants; survey of plant kingdom. (3 lecture, 6 lab hours)

104. Plant Physiology (4)
Prerequisite: Biol 1A or Bot 1, Chem 1A or 2A-B. General metabolism and related processes. (2 lecture, 6 lab hours)

106. Plant Taxonomy (4)
Prerequisite: Bot 1, Biol 1A, or 2A-B. Principles of plant classification; local flora. (1 lecture, 9 lab or field hours)

107. Plant Ecology (3)

Prerequisite: 6 units of biology, including 3 units in botany. Interrelations of plants and environment. (2 lecture, 3 lab or field hours)

123. Economic Botany (3)

Prerequisite: Biol 2A-B or Biol 1A or Bot 1. Plants (exclusive of ornamentals) used by man; origin, history of use, geographical distribution, botanical relationships, roles in ancient and modern civilizations.

134. Plant Anatomy (4)

Prerequisite: Bot 1 or Biol 1A. Initiation, development and structure of cells, tissues and tissue systems in roots, stems and leaves. (2 lecture, 6 lab hours)

135. Morphology of Non-vascular Plants (3)

Prerequisite: Bot 1. Comparative structure and phylogeny of the fungi, algae, mosses, and liverworts. (2 lecture, 3 lab hours)

136. Morphology of Vascular Plants (4)

Prerequisite: Bot 1. Comparative structure and phylogeny of ferns and seed plants. (2 lecture, 6 lab hours)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

ENTOMOLOGY

101. General Entomology (3)

Prerequisite: Biol 1B, Zool 1, or Biol 2A-B. Anatomy, physiology, life history, and classification of insects and other arthopods. (2 lecture, 3 lab or field hours)

106. Economic Entomology (3) (See Ag 106)

107. Medical Entomology (3)

Prerequisite: junior standing. Arthropod-borne diseases of man and animals and arthropod vectors of the diseases.

107L. Medical Entomology Laboratory (1)

Prerequisite or concurrently: Ent 107. (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 (3)

Prerequisite: Ent 101. Comparative study of the form and structure of insects; external and internal anatomy. (1 lecture, 6 lab hours)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

PHYSIOLOGY

1. Human Physiology (4)

Detailed study of the functions of the human body. (3 lecture, 3 lab hours)

170. General Physiology (4)

Prerequisite: organic chemistry. Physico-chemical phenomena common to all living material; osmosis, food requirements, respiration, metabolism, pH, permeability, colloids. (3 lecture, 3 lab hours)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

ZOOLOGY

1. General Zoology (5)

Prerequisite to most upper division courses in zoology. Survey of major phyla and principles of animal biology. (3 lecture, 6 lab hours)

103. Vertebrate Zoology (3)

Not open to students with credit in Zool 164. Prerequisite: Biol 1B, Zool 1, or Biol 2A-B. Study of the vertebrates. (2 lecture, 3 lab hours)

108. Parasitology (4)

Prerequisite: Zool 1; Chem 1A or 2A-B. Biology of parasites living in human beings. (2 lecture, 6 lab hours)

113. Natural History of Vertebrates (4)

Prerequisite: Biol 1B or equivalent; permission of instructor. Vertebrate classes; natural history of local species. (3 lecture, 3 lab or field hours)

114. Advanced Invertebrates (3)

Prerequisite: Zool 1. Invertebrates exclusive of insects, parasitic protozoa and helminths. (2 lecture, 3 lab or field hours)

134. Wildlife Management (3)

Prerequisite: Zool 1, Biol 1B, or 2A-B. Relation of vertebrates to human affairs. (2 lecture, 3 lab or field hours)

135. Mammalogy (4)

Prerequisite: Zool 1, Biol 1B or Biol 2A-B. Mammals of the world with emphasis on local species. (3 lecture, 3 lab or field hours)

137. Herpetology (4)

Prerequisite: Zool 1, or Biol 1B or equivalent. Reptiles and amphibians of the world with emphasis on local species. (3 lecture, 3 lab or field hours)

138. Animal Ecology (3)

Prerequisite: 6 units of biology, including 3 units in zoology; or permission of instructor. Environmental relationships of local vertebrates. (2 lecture, 3 lab or field hours)

140. Ichthyology (4)

Prerequisite: Zool 1, or Biol 1B, or equivalent. Identification, natural history, distribution, ecology, and management of fishes; fresh-water fishes of California, native and introduced. (3 lecture, 3 lab or field hours)

157. Histology (4)

Prerequisite: Zool 1. Identification and study of vertebrate cells, tissues, and organs. (2 lecture, 6 lab hours)

158. Elementary Hematology (3)

Prerequisite: Physio 1 or Zool 157. Identification of blood cells and practice in hematological procedures. (1 lecture, 6 lab hours)

160. Comparative Embryology of Vertebrates (4)

Prerequisite: Zool 103 or 164. Principles of development in amphioxus, frog, chick, pig, human. (2 lecture, 6 lab hours)

164. Comparative Anatomy of Vertebrates (4)

Prerequisite: Zool 1. Comparison of structures in selected vertebrates. (2 lecture, 6 lab hours)

165. Ornithology (4)

Prerequisite: Biol 1B, Zool 1, or Biol 2A-B or equivalent, permission of instructor. Introduction to the identification and natural history of birds with emphasis on local species. (3 lecture, 3 lab or field hours)

175. Vertebrate Evolution (2)

Prerequisite: Biol 120 and a biology field course. The course of evolution of the higher vertebrates including present concepts of speciation.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

NURSING DEPARTMENT

(In the Life Science Division)

Associate Professor: Gardner (Chairman)
Assistant Professors: Ahern, Bailey, Baumgartner, Bergey, Boghosian, M. Davis, E. Greene, Hansen, Jenkin, Krell, Matthes, Nishio, Scheyer, Welch
Instructor: Ermoian
Part-time: Shahbazian

The Nursing Department offers a bachelor of science degree with a major in nursing. Upon completion of the program the graduate will be eligible to take the examination required by the California State Board of Nursing Education and Nurse Registration for licensure to practice as a registered professional nurse. It also qualifies the graduate for the California certificate in public health nursing and provides a foundation for graduate study and advancement in the nursing profession. This program also provides an opportunity for the registered nurse to fulfill the requirements for the bachelor of science degree major in nursing.

The Nursing Department is accredited by the National League for Nursing and the California State Board of Nursing Education and Nurse Registration.

COOPERATING HOSPITALS AND AGENCIES

The Nursing Department utilizes the resources of Fresno Community Hospital, St. Agnes Hospital, Fresno General Hospital, Veteran's Administration Hospital (Fresno), Kings View Hospital (Reedley), Fresno County Health Department, and Kern County Health Department (Bakersfield). These facilities are used for clinical nursing laboratory experience which is correlated with course content.

BACHELOR OF SCIENCE DEGREE WITH MAJOR IN NURSING

The bachelor of science degree curriculum consists of 130 units, 63 of which are in the nursing major. The general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*). Completion of both Nurs 5 and 15 will meet general education requirements in health education.

NURSING MAJOR	*Units*
Nurs 1, 5, 15, 25	20
Nurs 105, 110, 115, 116, 120, 125, 130, 135, 145	43
	63

Additional Requirements: Bact 20, H Ec 31, Psych 111, 119, H Ed 163, Chem 2A-B, Biol 66, Physio 1, Soc 1A.

Provision for Students Who Are Registered Nurses

Registered nurses who are applicants for the bachelor of science degree must have met admission standards of the college, graduated from an accredited school of nursing, be legally entitled to practice nursing as an RN in the State of California, taken the NLN graduate examination either prior to admission or within the first year after enrollment, and must fulfill the requirements for the bachelor of science degree with a major in nursing. Credit by examination may be obtained for nursing and other courses up to the maximum of 30 units credit. Consult nursing advisers for further information on course requirements.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE MAJOR IN NURSING

In addition to the specific courses listed below, general education requirements and electives should be included to bring total to 15–17 units per semester. A total of 130 units must be completed for the bachelor of science degree. (See *Degrees and Credentials*)

1st Year: Nurs 1, 5, Chem 2A-B, Psych 7, Biol 66, Soc 1A, Physio 1
2nd Year: Nurs 15, 25, Bact 20, H Ec 31, Psych 119
3rd Year: Nurs 105, 110, 115, 125, Psych 111, H Ed 163
4th Year: Nurs 116, 120, 130, 135, 145

CREDIT FOR THE R.N. IN OTHER DEPARTMENTS

For information regarding advanced standing credit for registered nurses majoring in other departments, see *Regulations and Procedures.*

STANDARD DESIGNATED SERVICES CREDENTIAL WITH SPECIALIZATION IN HEALTH

(For this and other credential information see *Education Division* and *Health Education Department*)

Courses

1. Introduction to Nursing (2)

Orients students to professional nursing, appreciation of its heritage, and functions of the professional nurse in relation to other members of the nursing team.

5. Fundamentals of Nursing (4)

Theory and clinical experience in basic nursing skills to meet the psychological and physical needs of persons who are ill. (2 lecture, 6 lab hours)

15. Medical-Surgical Nursing A (7)

Prerequisite: Nurs 5. Guided clinical experience in basic nursing procedures; introductory pharmacology and diet therapy; laboratory experience in team nursing; principals and methods for implementing optimum care. (3 lecture, 12 lab hours)

25. Medical-Surgical Nursing B (7)

Prerequisite: Nurs 15, Bact 20, Biol 66, Physio 1. Guided experience in team concept in total nursing care of selected patients; measures necessary for prevention, treatment, and rehabilitation; the patient as a person, a member of a family and of a community; integration of diet therapy and pharmacology. (3 lecture, 12 lab hours)

105. Medical-Surgical Nursing C (8)

Prerequisite: Nurs 25. Continuation of Nurs 25. Experience in medical and surgical nursing specialties. (3 lecture, 15 lab hours)

110. Maternal-Child Nursing (8)

Prerequisite: Psych 119. Principles and application in care of the mother throughout pregnancy; the newborn infant and the well child; laboratory experience in the hospital and in community agencies providing care and education of the family, the mother and child. (4 lecture, 12 lab hours)

115. History of Nursing (2)

Survey of nursing history from the earliest time to the present; social, economic, and health conditions which influenced the development.

116. Trends in Nursing Education (3)

Prerequisite: Nurs 110, 115. Influence of social, political, religious, health, and scientific movements on the progress of nursing; trends, problems and responsibilities of the professional nurse.

117. Medical-Surgical Nursing Seminar (3)

Open only to registered nurses. Basic medical-surgical and pathologic-physiology concepts that provide scientific rationale for patient's health care; new techniques and therapeutic measures.

118. Maternal-Child Nursing Seminar (3)

Open only to registered nurses. New concepts of total nursing care during the maternal cycle; child's growth and development as related to health and prevention of disease.

119. Psychiatric Nursing Seminar (3)

Open only to registered nurses. Concepts of nursing care of emotionally immature or socially disorganized personality; current therapy in the treatment of mental illness and role of the nurse in supportive care.

120. Psychiatric Nursing (8)

Prerequisite: Nurs 110, Psych 111. Mental disorders, the psychoses and psychoneuroses; causes, prevention, treatment, and total nursing care; social problems involved in modern concepts of mental illness. (3 lecture, 15 lab hours)

125. Seminar in Nursing (2)

Basic concepts of research as it relates to reading nursing studies; understanding problem-solving techniques.

130. Public Health Nursing (8)

Prerequisite: Nurs 110, H Ed 163. Basic principles and practices of public health; responsibility of the public health nurse in community programs for health and social welfare. (3 lecture, 15 lab hours)

135. Legal Problems in Nursing Education (2)

Prerequisite: Nurs 105. The conduct, rights, and responsibilities of a professional nurse; analysis of the legal status, obligations, and liabilities of the nurse.

140. Disaster Nursing (1)

Role of professional nurse in a disaster situation; planning and directing nursing care; working with other professions and organizations; life-saving measures and health maintenance; major nursing problems.

145. Principles of Administration in Nursing (2)

Principles of nursing service administration; ward management and its place in the organization structure of the hospital; inter-personal relationships employing the team concept.

PSYCHOLOGY DEPARTMENT

(In the Life Science Division)

Professors: Tenney (Chairman), Fisher, Lindquist
Associate Professors: Abou-Ghorra, Burton, Holder, Leavitt, H. E. Madden, Powell
Assistant Professors: Button, Cooper, Moroz, Shenfeld, Thomas
Instructor: Pieper
Part-time: G. Graves, Willemsen, Zeifert

The Psychology Department offers work leading to the bachelor of arts and the master of arts degrees. One undergraduate core of courses serves all psychology majors. Students planning to pursue graduate work in psychology should check carefully with their advisers and the graduate schools of their choice regarding requirements for admission and should plan to use their electives within the major largely to satisfy such requirements.

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 following *Degrees and Credentials*, and consult an adviser in the Psychology Department.

PSYCHOLOGY MAJOR

	Units
Psych 25, 66, 101, 102, 110, 118	18
Psychology electives	18
(Recommended electives in preparation for graduate work: Psych 104, 163, and at least three courses from Psych 108, 117, 131, 135, 137, 145, 150, 151, 152)	
	36

Additional Requirements: 12 units from at least three fields—anthropology, biological science, literature, foreign language, mathematics, philosophy; courses must be upper division except in foreign language and must be in addition to general education requirements. At least two years of French, German, or Russian are recommended in preparation for graduate work.

PHILOSOPHY-PSYCHOLOGY MAJOR

	Units
Psych 25, 66, 101, 102, 110, 118	18
Phil 10A-B, 165; 110 or Math 130	12
Elect from: Phil 102, 140, 141	3
Elect from: Phil 152, 153, 155, 162	3
Elect from: Anthro 2, 103, 104	3
	39

PSYCHOLOGY MINORS

General Psychology Minor

Psych 25, 66, 101; 102 or 118	12
Psychology electives	9
	21

Recommended: Math 130.

Psychology Minor for Social Welfare

Psych 25 or equivalent	3
Psych 66, 145, 152	9
Elect from: Psych 103, 110, 111, 116, 117, 119, 120, 123, 152F	6
	18

Psychology Minor for Speech Correction-Audiology

Psych 66, 111, 145	9
Elect from: Psych 25, 119, 120, 135, 152, 161, 168, 175	12
	21

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

STANDARD DESIGNATED SERVICES CREDENTIAL WITH SPECIALIZATION IN PUPIL PERSONNEL SERVICES

(See *Advanced Professional Studies Department*)

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in psychology is based on the equivalent of the undergraduate major in psychology at Fresno State College. The master of arts degree provides two options. The program in child-clinical psychology is designed to prepare for service in clinics, schools, and hospitals and for further graduate work. The program in general experimental psychology provides one year of graduate work in preparation for further, more advanced, study in other graduate schools or as part of the preparation for college teaching.

The departmental requirements for advancement to candidacy include a written examination set by the department, in addition to the Graduate Record Examination. A thesis is required for the degree. For further specific requirements see the chairman of the department; for general requirements see *Degrees and Credentials—Master's Degrees.*

Courses

PSYCHOLOGY

Note: Psych 7 or 10 is prerequisite to all upper division psychology courses.

7. Introduction to Psychology (3)

Meets the psychology requirement for general education. Open only to freshmen. Individual approach to problems of adjustment; scientific principles of psychology in perception, learning, motivation, emotions, intelligence, aptitudes, and personality.

10. General Psychology (3)

Meets the psychology requirement for general education. Not open to freshmen or to students with credit in Psych 7. Fundamental principles of the study of behavior and experience.

16. Personal and Social Adjustment (3)

Not open to freshmen. Recommended: Psych 7 or 10. Personality factors as they relate to problems of adjustment.

25. Elementary Statistics (3)

Prerequisite: two years high school algebra or Math B. Descriptive statistics and elementary hypothesis testing in the behavioral sciences. (2 lecture, 2 lab hours)

66. Differential Psychology (3)

Basic considerations in the problems of individual and group data, heredity and environment, genetics and maturation.

101. Behavioral Research I (3)

Prerequisite: Psych 25, 66. Experimental methodology course to introduce techniques of the scientific method; research pursuits in psychophysics, and in physiological, learning, and comparative psychology. (2 lecture, 3 lab hours)

102. Behavioral Research II (3)

Prerequisite: Psych 101. Techniques used in studies and experiments in social, personality, developmental, and clinical psychologies. (2 lecture, 3 lab hours)

103. Personality (3)

Basic theoretical concepts.

104. Intermediate Statistics in Psychology (3)

Prerequisite: Psych 25 or equivalent. Advanced procedures in analysis and interpretation of psychological data. (2 lecture, 2 lab hours)

108. Foundations of Behavioral Science (3)

Prerequisite: Psych 66 or permission of instructor. Critical evaluation of the bases of psychological theories and their relationship to areas of the philosophy of science.

110. History and Systems (3)

Prerequisite: Psych 66 or permission of instructor. Philosophical and historical background of psychology through the first quarter of the twentieth century; establishment of earlier schools and systems of psychology.

111. Mental Hygiene (3)

Basic processes in adjustment; mental health and social problems; application of principles of emotional health.

115F. Field Work With Exceptional Children (1) (Same as A Ed 115F)

Prerequisite: Psych 168. Direct work with exceptional children; supervised experiences in guidance and counseling of exceptional children in special classes and in community facilities.

116. Analytical Psychologies (3)

Prerequisite: permission of instructor. The contributions of Freud, Adler, Jung and other depth-psychologists.

117. Personality in Nature and Culture (3)

Hereditary, physiological, geographical, social and cultural factors in the development of personality; theories of personality.

118. Developmental Psychology (3)

Open only to psychology majors and minors; not open to students with credit in Psych 119, 120, or 123. The psychology of development; infancy, childhood, adolescence, maturity, and old age.

119. Child Psychology (3)

The dynamics of development and adjustment.

120. Adolescent Psychology (3)
Adjustment of youth to self and society.

123. Maturity and Old Age (3)
Psychological study of maturity and old age; physiological and sociological considerations.

131. Motivation (3)
Prerequisite: Psych 66 or permission of instructor. Factors responsible for instigation and modification of behavior.

133. Contemporary Psychological Theories (3)
Prerequisite: Psych 110; 18 units of psychology or permission of instructor. Analysis and development of current theoretical emphasis in psychology; contemporary psychological literature.

135. Learning (3)
Prerequisite: Psych 101 or permission of instructor. Principles of learning.

137. Sensation and Perception (3)
Prerequisite: Psych 101 or permission of instructor. The interpretation of sensory data.

139. Thinking and Language (3)
Prerequisite: Psych 101 or permission of instructor. Communication and other symbolic processes.

141. Psychology of Religion (3)
The psychological foundations of religious experience.

145. Social Psychology (3)
The interaction of individuals in groups.

146. Methods in Social Psychology (3)
Prerequisite: Psych 25 or equivalent; Psych 145 (or concurrently). Basic methods in survey research; group dynamics; communication studies; attitude scaling.

147. Psychology of Small Groups (3)
Basic principles of social interaction in small group situations; problems of group leadership and communication; development of attitudes and skills for effective group participation.

150. Comparative Psychology (3)
Prerequisite: Psych 101 or permission of instructor. Comparative functions and behavior of animals. (3 lecture, 2 lab hours)

151. Physiological Psychology (3)
Prerequisite: Psych 101 or permission of instructor. Relationship between physiological processes and behavior.

152. Abnormal Psychology (3)
Theoretical examination of origins, symptoms and treatments of personality disturbances.

152F. Clinical Psychopathology (3)
Prerequisite: permission of instructor. Case material with clinical analyses from psychiatric viewpoint. (2 lecture, 2 clinical lab hours)

153. Psychology of the Criminal (3) (See Crim 153)

161. Clinical Psychology (3)

The clinician's application of techniques and treatment procedures.

163. Psychological Tests (3)

Prerequisite: Psych 25 or equivalent. Theory of psychological measurement with emphasis on group testing. (1 lecture, 2 2-hour labs)

167. Psychology of Mental Retardation (3)

Psychological aspects of mental retardation; parent-child problems, etiology, nosology, school placement, institutionalization, treatment and recognition of all types.

168. Psychology of Exceptional Children (3)

Not open to students with credit in A Ed 115. The atypical child; etiology, symptomology, nosology, recognition and recommendations.

174. Principles and Techniques in Guidance (3) (See A Ed 174)

175. Family Counseling (3)

Prerequisite: permission of instructor. Psychodynamic treatment of family problems; methods of counseling; psychotherapy.

181. Industrial Psychology (3)

Occupational assessment; training procedures; production efficiency; morale determinants; human engineering; decision processes; organization theory.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study.*

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200. Seminar in Psychology (3; max see below)

May be repeated with different topics. Prerequisite: permission of instructor. Seminars in psychodynamics, personality, psychological measurement, counseling and psychotherapy, genetic psychology, experimental psychology, social psychology, applied psychology, learning, research design, physiological and comparative psychology, theoretical problems.

201. Seminar in Experimental Methods (3)

Prerequisite: Psych 102, permission of instructor. Measurement and analysis in behavioral research.

202. Seminar in Psychometrics (3)

Prerequisite: Psych 104, permission of instructor. Survey and test design and analysis in behavioral research.

204. Advanced Statistical Methods (3)

Prerequisite: Psych 104 or equivalent. Advanced parametric and non-parametric statistics and their application in psychological research.

209. Advanced Psychological Theory (3)

Prerequisite: Psych 133, permission of instructor. Current psychological literature; theoretical significance.

218. Mental Hygiene and Guidance of Children (3) (See A Ed 218)

224. Counseling Techniques (3) (Same as A Ed 224)

Prerequisite: Psych 174 or permission of instructor. Interviewing; directive and nondirective counseling techniques.

224F. Field Work in Counseling (2) (Same as A Ed 224F)

Prerequisite: Psych 224, 25 units of pupil personnel services credential sequence, permission of instructor one semester in advance of assignment. Supervised practice in counseling in a college or high school counselor's office.

262. Diagnostic Clinical Interviewing (3)

Prerequisite: Psych 265 and permission of instructor. Case study, counseling, testing. Field work under supervision.

263. Therapeutic Clinical Interviewing (3)

Prerequisite: Psych 262 and permission of instructor. Practice in interviewing; use of available field resources such as schools, clinics, hospitals.

264. Diagnosis of Exceptional Children (3)

Prerequisite: permission of instructor. Advanced administration and interpretation of individual and group techniques. Field work under supervision.

265. Individual Mental Testing (3) (Same as A Ed 255)

Not open to students with credit in A Ed 165. Prerequisite: Psych 163, permission of instructor. Administration, interpretation, and use of current individual intelligence tests. Field work.

266A. Projective Techniques (3)

Prerequisite: Psych 152, 161, 265, permission of instructor. Seminar on basic assumptions and applications of projective devices.

266B. Projective Techniques (3)

Prerequisite: Psych 152, 161, 265, permission of instructor. Seminar on administration and scoring of projective devices.

267. Externship-Internship: Case Studies (2-12; max total 12, for master's degree 6)

Prerequisite: Psych 265, admission to candidacy for master's degree or to credential program; permission of instructor. Diversified experience in evaluation and case study; reading, speech and children's clinics, schools, special classes, hospitals, staff conferences and clinical practicum. Supervision by college and facility staffs.

271. Group Techniques (3)

Prerequisite: Psych 262, 263, permission of instructor. Application of group process techniques to counseling, therapy, schools, and industrial settings.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

291. Practicum in Research (1-6; max total 6)

Prerequisite: completion of undergraduate major in psychology. Supervised research experience for students.

299. Thesis (2-4; max total 4)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

PHYSICAL EDUCATION-RECREATION DIVISION

Division Head ..... Cecil N. Coleman

Department	*Chairman*
Physical Education—Men	Ara Hairabedian
Physical Education—Women	R. Elaine Mason

The Physical Education-Recreation Division provides a broad program of physical education activities for all students. The program is designed to provide the kinds of experiences that will offer students ample opportunity to learn the skills they may use profitably now and later in their leisure time; opportunities for all students to enjoy the satisfactions associated with participation in intramural activities; an educationally sound, vigorous intercollegiate athletic program for the highly skilled men students; and preparation for teaching physical education in public schools.

The division offers majors and minors for the bachelor of arts degree, a major in recreation for the bachelor of science degree, and a master of arts degree in physical education.

Physical Education—Men 244
Recreation 250
Physical Education—Women 252

PHYSICAL EDUCATION DEPARTMENT—MEN

(In the Physical Education-Recreation Division)

Professors: H. Beatty, Coleman, Hanner, B. Johnson, Pape, Warmerdam
Associate Professors: Hairabedian (Chairman), Anderson, Beiden, Burgess, Gleason, Krueger, H. Miller, Wild
Assistant Professors: Adler, Juliana
Instructor: Van Galder
Part-time: Guzman

The Men's Physical Education Department offers majors and minors for the bachelor of arts degree in physical education, bachelor of science degree in recreation, and the master of arts degree in physical education. The degree programs provide students with scientific, theoretical, and practical educational backgrounds for teaching physical education. The activity program is designed to permit students to meet the college physical education requirement in harmony with their fitness and interest needs. For students desiring additional opportunity for participation, a broad intramural program is available; for highly skilled students, a varied intercollegiate athletic program is available.

ACTIVITIES

Students are expected to take physical education activities (PE 10 or 40 series) during the first four semesters. Entering freshmen are given a motor skills test during freshman week which assists in assignment to an appropriate section of PE 10-1. All students are given a water skills test during freshman week; those failing must take beginning swimming, and those passing may elect swimming. Additional activity courses, up to a total of 12 units for physical education major or minor students and 8 units for others, may be counted toward a bachelor's degree. Physical education activities taken after the general education requirement has been met may count as upper division credit. Candidates preparing for elementary teaching or minoring in physical education are advised to have experience in rhythmic activities (PE 40-11).

MAJOR

A major in physical education for the bachelor of arts degree consists of 42 units listed below, exclusive of the general education requirement.

	Units
PE 30, 35A-B-C, 45A-B-C-D-E, Rec 60	13
PE 106, 108, 125A-B-C-D, 151, 152, 153, 154, 156, 159	29
	42

Additional Requirements: Physio 1, Biol 66; Phys Sc 10 or 12 or Chem 2A; Soc 1A or Anthro 2; H Ec 40 or 42.

MINOR

The minor in physical education consists of 21 units of which at least 12 must be upper division and permits, with guidance, a selection of courses to satisfy special interests and needs.

	Units
PE 30, 35A-B-C, 45A-B-C-D	9
PE 106, 151, 152, 153	8
PE electives 125A-B-C-D	4
	21

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard

teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in physical education is based on the equivalent of the undergraduate major at Fresno State College. At least 14 of the 30 units required for the degree must be in graduate courses in physical education. For specific requirements, consult the chairman of the department; for general requirements, see *Degrees and Credentials—Master's Degrees.*

Courses

PHYSICAL EDUCATION—MEN

10. Physical Education Activities

Not more than 2 units in any one activity may be applied toward the general education requirement. Upper division credit (PE 110) will be given for PE 10 activities, with exception of PE 10-1, 10-2, taken after the general education physical education requirement has been met. Participation in organized physical education activities including group games, individual sports, and basic skills in physical education. (3 hours)

10-1. Group Games (1)
10-2. Group Games (1)
10-4. Cross Country (1)
10-5. Individually Adapted Exercise (1)
10-6. American Football (1)
10-7. Basketball (1)
10-8. Track and Field (1)
10-9. Baseball (1)
10-10. Elementary Swimming (1)
10-11. Intermediate Swimming (1)
10-12. Advanced Swimming (1)
10-13. Elementary Boxing (1)
10-15. Advanced Boxing (1)
10-16. Elementary Wrestling (1)
10-18. Advanced Wrestling (1)
10-19. Elementary Tennis (1)
10-20. Intermediate Tennis (1)
10-21. Advanced Tennis (1)
10-22. Elementary Handball (1)
10-23. Intermediate Handball (1)
10-24. Advanced Handball (1)
10-25. Elementary Golf (1)
10-26. Intermediate Golf (1)
10-27. Advanced Golf (1)
10-28. Elementary Archery (1)
10-29. Intermediate Archery (1)
10-31. Elementary Gymnastics (1)
10-32. Intermediate Gymnastics (1)
10-34. Elementary Badminton (1)

10-35. Intermediate Badminton (1)
10-37. Elementary Volleyball (1)
10-38. Intermediate Volleyball (1)
10-40. Body Building (1)
10-45. Self-Defense (1)
10-52. Advanced Water Polo (1)

30. Foundations of Physical Education (2)
Introduction to the physical education program in secondary schools; personal, social, and professional requirements; demands on the physical education teacher.

35A-B-C. Theory and Analysis of Physical Education Activities (1-1-1)
For prospective physical education teachers. Analysis and practice of skills in each activity; rules; techniques.
(A) Speedball-Soccer-Volleyball-Softball. (B) Combatives. (C) Gymnastics.

40. Coeducational Activities
Upper division credit (PE 140) will be given for PE 40 activities taken after the general education physical education requirement has been met.

40-5. Senior Lifesaving (1) (Prerequisite: permission of instructor)
40-8. Advanced Tennis (1)
40-11. Elementary Folk and Square Dancing (1)
40-12. Intermediate Folk and Square Dancing (1)
40-14. Elementary Social Dancing (1)
40-16. Elementary Modern Dance (1)
40-17. Intermediate Modern Dance (1)
40-18. Advanced Modern Dance (1)
40-21. Elementary Archery (1)
40-24. Elementary Bowling (1) (Former 40-19) (Fee $1.30 per week)
40-25. Intermediate Bowling (1) (Fee $1.30 per week)
40-27. Elementary Ice Skating (1) (Former 40-20) (Fee $15)
40-28. Intermediate Ice Skating (1) (Fee $15)
40-31. Elementary Badminton (1)
40-32. Intermediate Badminton (1)
40-37. Intermediate Golf (1)

45A. Fundamentals of Aquatics (1)
Open to men and women physical education majors and minors. Prerequisite: intermediate skill. Analysis and practice of beginner's skills and swimming strokes; elements of diving and skills basic to lifesaving; skill progression for various levels; water polo, scuba diving. (2 hours; clinic as needed)

45B. Fundamentals of Tennis (1)
Open to men and women physical education majors and minors. Prerequisite: intermediate skill. Analysis and practice of strokes and tactics; rules; history; skill progression for various levels. (2 hours; clinic as needed)

45C. Fundamentals of Badminton and Golf (1)
Open to men and women physical education majors and minors. Analysis and practice of fundamentals of badminton and golf; organization and conduct of these activities in secondary school physical education program. (2 hours; clinic as needed)

45D. Fundamentals of Folk, Square, and Social Dance (1)

Open to men and women physical education majors and minors. Prerequisite: intermediate skill. Theory and practice of elementary leadership in folk, square, and social dance. (2 hours; clinic as needed)

45E. Fundamentals of Social Recreational Activities (2)

Open to men and women physical education majors and minors. Selection, evaluation, and organization of social recreational activities; facilities and equipment evaluation; practical projects for leadership in home, school, and community activities. (2 2-hour lecture-labs)

106. Care and Conditioning of Athletes (1-2)

Principles of training for specific athletic schedules; methods of preventing injuries in athletic competition; first aid treatment of athletic injuries; demonstrations and practice in prophylactic taping techniques; training room laboratory experience.

108. Organization of Intramural Sports (2)

For physical education majors. Organization, administration, and motivation of a program of intramural activities in secondary schools.

110. Physical Education Activities

Upper division credit will be given for PE 10 activities, with the exception of PE 10-1, 10-2, taken after the general education physical education requirement has been met. For list of activities see PE 10.

112A-B-C-D. Theory and Practice of Officiating (1-1-1-1)

Prerequisite: varsity squad experience in each sport or PE 125A-B-C-D. Analysis and interpretation of rules for major sports; procedure and practice in officiating.
(A) Football. (B) Basketball. (C) Track and Field. (D) Baseball.

125A-B-C-D. Theory and Analysis of Teaching Sports (2-2-2-2)

For prospective physical education teachers. Principles underlying participation in competitive interscholastic athletics; theory of coaching sports, technique; arrangement and conduct of games and schedules.
(A) Football. (B) Basketball. (C) Track and Field. (D) Baseball.

140. Coeducational Activities

Upper division credit will be given for PE 40, activities, taken after the general education physical education requirement has been met. For list of activities see PE 40.

151. Curriculum Development of Physical Education in Secondary Schools (3)

Open to men and women. Prerequisite or concurrently: PE 125A-B-C-D. Principles applied to the teaching-learning process; organization and observation of physical education activities in secondary schools; development of physical education programs.

152. Elementary School Physical Education (2)

Open to men and women. Prerequisite or concurrently: E Ed 105; one course in rhythmical activities (for men PE 40-11; for women PE 40-11, 40-16, 40-17) and one course in group games or fundamentals (for men PE 10-1, 10-2; for women PE 50-28). Activities, materials, and methods for teaching physical education in elementary schools based on the California state program. (2 2-hour lecture-labs)

153. Principles of Physical Education (2)

Open to men and women. Prerequisite: PE 30, 151, and senior standing. Principles basic to sound philosophy of physical education for the space age; historical development; relationship to health education, recreation, and other areas; foundation and functions of physical education in contemporary American society.

154. Organization and Administration of Physical Education in Secondary Schools (3)

Open to men and women. Prerequisite or concurrently: PE 151. Consideration of classification, scheduling, planning facilities for instruction and recreation; role of the physical education teacher in recreation, equipment, budget, co-curricular program, student leadership, community relationship.

155. Camp Counseling (2)

Open to men and women. For in-service counselors and students wishing summer camp employment. Philosophy, organization, and programs of various types of organized camps; requirements for counselors. Laboratory experiences in program activities, including an overnight class camping trip.

156. Kinesiology, Physiology of Exercise, and Adapted Activities (5)

Open to men and women. Prerequisite: Physio 1, Biol 66. Function and mechanics of human motion; aims, techniques, and procedures in prevention and correction of recognized divergencies; planning, evaluation, and selection of adapted activities suitable for the atypical student.

157. Recreation and Youth Leadership (1-2; max total 4)

Open to men and women. Prerequisite: permission of instructor. Practical experience as assistant leaders of organized children's and youth groups. Weekly conference with instructor.

159. Tests and Measurements (3)

Open to men and women. Scientific testing in physical education; analysis, study, and construction of tests; diagnosis of physical efficiency and physiological reactions to exercise, sports, and games.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

201. Physical Education Facilities and Equipment (2)

Open to men and women. Functional planning of indoor and outdoor physical education facilities and equipment for schools and recreational centers; design and construction of facilities for a complete physical education program; survey of school plants in the San Joaquin Valley.

202. Seminar in Program Development (2)

Open to men and women. Prerequisite: PE 151 or permission of instructor. Projects in the development of secondary school physical education programs; program construction and evaluation.

209. Problems in Secondary School Physical Education (2)

Open to men and women. Physical education problems in activity program; athletic program; intramural program; recreation program (including camping); and health instruction.

220. Research in Education (2) (See A Ed 220)

254. Seminar in Physical Education Administration (2)

Open to men and women. Current problems and practices in organization and administration of physical education programs in secondary schools.

272. Problems in Body Mechanics (2)

Open to men and women. Prerequisite: PE 156, S Ed 166; or permission of instructor. Analysis of posture and body mechanics; methods and techniques for examination and treatment of faulty body mechanics; exercises for achieving and maintaining correct body mechanics.

273. Problems in Analysis of Athletic Performance (2)

Open to men and women. Analysis of performance in various sports; application of fundamental laws of physics and principles of the physiology of muscular activity to human performance.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis or Project (2-4; max total 4)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

RECREATION

(In the Physical Education-Recreation Division)

The Physical Education-Recreation Division offers a bachelor of science degree with a major in recreation for students who plan to prepare for positions requiring major responsibility for leadership, supervision, and administration in public, private, industrial, hospital, park, youth, church, camping, outdoor education, and commercial recreation agencies. Recreation is closely allied with fields other than physical education. Additional courses emphasized in the recreation major sequence include practical and theoretical courses in recreation, crafts, music, drama, speech, and science.

BACHELOR OF SCIENCE DEGREE

The bachelor of science degree with a major in recreation is granted upon completion of 128 units including the courses listed below. The general degree regulations and general education requirements must also be fulfilled.

RECREATION MAJOR	*Units*
Rec 60, 160, 161A-B, 162, 163A-B	18
PE 45A, 45E, 152	5
Elect from: (Men) PE 35A, 35C, 125A-B-C-D; (Women) PE 15C, 50-46, 112	2
Biol 101, 102, HEd 48	5
Pol Sc 164B, S Welf 128	5
Psych 111, 119, 120	9
	44

Additional Requirements: In addition to the above courses, the following are required: Art 119, PE 40-11 and PE 10-19 or 50-6. (May apply on general education requirements.)

Special Area Requirements: The required special area program of 20-22 units consists of one of the course groups shown below under art, industrial arts, music, and speech arts and the following additional courses, if not included in the group selected: Art 135; IA 133 (2 un) or 162; Mus 9; and Drama 137, 159.

Art: Art 3, 4, 11, 101, 135, 144 (14 un)
Industrial Arts: IA 80, 133, 162, 164, 179 (13 un)
Music: Mus 1-101, 9, 10-110, 129; 1 unit music elective (12 un)
Speech Arts: Drama 33, 34, 133, 137, 159, (13 un)

RECREATION MINOR

The minor in recreation for the bachelor of arts degree consists of 22 units of which 6 must be upper division and permits, with guidance, a selection of courses to satisfy special interests and needs. The recreation minor gives training in activities suitable for use in recreation programs of communities, schools, youth groups, churches, and clubs.

Recreation Minor	*Units*
PE 40-11, 45D, 45E	4
Rec 60, 161A; 163A or 163B	8
Elect from: Art 11; IA 133, 177, 178	2
Elect from: Music 1-101 (college chorus); 11A-B, 76, 121A-B	2
Elect from: Drama 33, 34	3
Elect from: Art (Art 135 recommended), IA, Mus, PE, Spch Arts	3
	22

Courses

RECREATION

60. Introduction to Recreation (2)

Not open to students with credit in PE 158. General orientation to the profession of recreation; lectures, discussion, practical experience and observation; place of recreation in education.

160. Camp Management (2)

Not open to students with credit in PE 155. Prerequisite: Rec 60 or permission of instructor. Theory and practice; basic knowledge of practical skills in camping; administration, organization, and programming in various camp settings; functional projects. Overnight and/or week-end camping trips (approximately $10 camp trip expenses). (2 2-hour lecture-labs)

161A. Organization and Administration of Recreation (2)

Prerequisite: Rec 60 or permission of instructor. Nature and scope of recreation organization; community organization for recreation; recreation agencies and their services.

161B. Organization and Administration of Recreation (2)

Prerequisite: Rec 161A or permission of instructor. Administration of recreation; scope and significance of recognized practices; effective approach to special problems in recreation administration. Individual and group field trips.

162. Programs of Recreation (2)

Prerequisite: Rec 161A, PE 45E, or permission of instructor. Areas of concentration on leadership principles and procedures; essentials of programming, planning aids, indoor and outdoor activities; mechanics of planning, techniques of presentation, repertoire of recreational activities. (2 2-hour lecture-labs)

163A-B. Conference and Field Work in Recreation (4-4)

Prerequisite: Rec 162 or permission of instructor. Practical experience as leader or assistant leader in organized recreation programs. Experience, under supervision, in both private and public recreation required. Weekly conferences with college supervisor.

170. Recreation and Park Planning (3)

Prerequisite: Rec 162 or permission of instructor. Functional planning for recreation and park services; application of principles; interpretation and use of standards; relation of programs, personnel, finance, legislation, acquisition, and design in the planning process. Functional project, field trip required.

PHYSICAL EDUCATION DEPARTMENT—WOMEN

(In the Physical Education-Recreation Division)

Professor: Bigelow
Associate Professors: Mason (Chairman), Doyle, Hupprich, Sample
Assistant Professor: Thompson
Instructors: Hupp, J. A. Martin, Walts
Part-time: Schroll

The Women's Physical Education Department offers the bachelor of arts degree, a major and minor in physical education, and the master of arts degree in physical education. The program provides students with scientific, theoretical, and practical backgrounds for teaching physical education. Programs are planned to meet individual needs and to emphasize an understanding of the relationships of physical education to the cultural pattern of today's society. The activity program permits students to take activities in harmony with their fitness and interest needs. Additional opportunity for participation is provided through the department-sponsored programs of the Women's Recreation Association and Orchesis.

ACTIVITIES

Students are expected to take physical education activities (PE 40 or 50 series) during the first four semesters. Additional activity courses, up to a total of 12 units for physical education major or minor students and 8 units for others, can be counted toward a bachelor's degree. Upper division credit will be given for physical education activities taken after the general education requirement has been met. Activity selection must meet with approval of the department. Candidates preparing for elementary teaching or minoring in physical education are advised to have activity experience in fundamentals (PE 50-28) and rhythmic activities (PE 40-11 or 40-16).

PHYSICAL EDUCATION MAJOR

Particular attention is given the health status of physical education majors. See section on *Entrance Examinations* for physical and medical examination requirements. Medical rechecks will be made whenever advisable.

	Units
PE 15A-B-C-D, 30, 45 A-B-C-D-E, Rec 60	16
PE 112, 115A-B-C-D, 151, 152, 153, 154, 156, 159	25
Elect from: PE 155, 162	3
	44

Additional Requirements: Biol 66, Physio 1; Phy Sc 10 or 12, or Chem 2A; Soc 1A or Anthro 2; Home Ec 40

PHYSICAL EDUCATION MINOR

The minor in physical education consists of 21 units of which at least 12 must be upper division.

	Units
PE 15A-B-D, 30, 45A or B, 45D, 115A or B, 151, 152	16
Elect from: PE 115A, 115B, 115D, 155, 159	5
	21

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard

teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in physical education is based on the equivalent of the undergraduate major at Fresno State College. At least 14 of the 30 units required for the degree must be in graduate courses in physical education. For specific requirements, consult the chairman of the department; for general requirements, see *Degrees and Credentials—Master's Degrees.*

Courses

PHYSICAL EDUCATION—WOMEN

15A. Fundamentals of Rhythmic Activities (2)

Prerequisite: PE 40-16. Practice and analysis of body movement in dance; rhythmic, space and quality elements; elementary composition; brief history of dance. (2 2-hour lecture-labs)

15B. Fundamentals of Team Sports (2)

Prerequisite: PE 50-46 (major-minor section). Practice and analysis of skills and team strategies of soccer, speedball, volleyball, and softball; interpretation of rules; drill practices and skill tests. (2 2-hour lecture-labs)

15C. Fundamentals of Basketball (1)

Open to physical education majors and minors. Analysis and practice of skills and team play; interpretation of rules. (2 1-hour lecture-labs)

15D. Fundamentals of Gymnastics and Track and Field Activities (1)

Open to physical education majors and minors. Analysis and practice of elementary gymnastics and track and field activities; exercises appropriate for conditioning the participant. (2 1-hour lecture-labs)

30. Foundations of Physical Education (2)

Introduction to the physical education program in secondary schools; personal, social, and professional requirements; demands on the physical education teacher.

40. Coeducational Activities

Upper division credit (PE 140) will be given for PE 40 activities taken after the general education physical education requirement has been met.

40-5. Senior Lifesaving (1) (Prerequisite: permission of instructor)

40-8. Advanced Tennis (1)

40-11. Elementary Folk and Square Dancing (1)

40-12. Intermediate Folk and Square Dancing (1)

40-14. Elementary Social Dancing (1)

40-16. Elementary Modern Dance (1)

40-17. Intermediate Modern Dance (1)

40-18. Advanced Modern Dance (1) (Former PE 50-18)

40-21. Elementary Archery (1)

40-24. Elementary Bowling (1) (Former 40-19) (Fee $1.30 per week)

40-25. Intermediate Bowling (1) (Fee $1.30 per week)

40-27. Elementary Ice Skating (1) (Former 40-20) (Fee $15)

40-28. Intermediate Ice Skating (1) (Fee $15)

40-31. Elementary Badminton (1)

40-32. Intermediate Badminton (1)

40-37. Intermediate Golf (1)

45A. Fundamentals of Aquatics (1)

Open to men and women physical education majors and minors. Prerequisite: intermediate skill. Analysis and practice of beginner's skills and swimming strokes; elements of diving and skills basic to lifesaving; skill progression for various levels; water polo, scuba diving. (2 hours; clinic as needed)

45B. Fundamentals of Tennis (1)

Open to men and women physical education majors and minors. Prerequisite: intermediate skill. Analysis and practice of strokes and tactics; rules; history; skill progression for various levels. (2 hours; clinic as needed)

45C. Fundamentals of Badminton and Golf (1)

Open to men and women physical education majors and minors. Analysis and practice of fundamentals of badminton and golf; organization and conduct of these activities in secondary school physical education program. (2 hours; clinic as needed)

45D. Fundamentals of Folk, Square and Social Dance (1)

Open to men and women physical education majors and minors. Prerequisite: Intermediate skill. Theory and practice of elementary leadership in folk, square, and social dance. (2 hours; clinic as needed)

45E. Fundamentals of Social Recreational Activities (2)

Open to men and women physical education majors and minors. Selection, evaluation, and organization of social recreational sports and activities; facilities and equipment evaluation; practical projects for leadership in home, school, and community activities. (2 2-hour lecture-labs)

50. Physical Education Activities

Upper division credit (PE 150) will be given for PE 50 activities taken after the general education physical education requirement has been met.

50-1. Elementary Swimming (1)

50-2. Low Intermediate Swimming (1)

50-3. High Intermediate Swimming (1)

50-6. Elementary Tennis (1)

50-7. Intermediate Tennis (1)

50-21. Archery (1)

50-27. Adaptive Body Mechanics (1)

50-28. Fundamentals (1)

50-31. Badminton (1)

50-36. Elementary Golf (1)

50-37. Intermediate Golf (1)

50-46. Team Sports (1; max total 2)

112. Techniques of Officiating Tennis and Basketball (1)

Prerequisite: previous experience in playing tennis and basketball. Interpretation of rules, officiating techniques, practice in officiating. Examinations and ratings are given by the San Joaquin Board of Women Officials, which collects 75 cents for each practical and 25 cents for each written examination. (2 1-hour lecture-labs)

115A. Theory and Analysis of Teaching Modern Dance (2)

Prerequisite: PE 15A. The dance as an art; criteria for judging the dance and dancers; contemporary dance scene. Practice in planning and presenting techniques, movement progression, and group studies (2 2-hour lecture-labs)

115B. Theory and Analysis of Teaching Team Sports (2)

Prerequisite: 15B-C. Practice and theory of techniques involving team sport units for the secondary school; skill progression, evaluating techniques, class organization, and officiating. (2 2-hour lecture-labs)

115C. Theory and Analysis of Teaching Tennis and Swimming (1)

Prerequisite: PE 45A-B. Preparation of lesson plans for swimming and tennis. Practice teaching followed by class evaluation. Opportunity to observe and assist in the conduct of swimming meets and tennis tournaments. (2 lecture-lab hours)

115D. Theory and Analysis of Teaching Gymnastics, Tumbling, and Apparatus (1)

Prerequisite: PE 15D. Analysis and practice of elementary stunts in tumbling, pyramid building, apparatus, trampoline, skill progressions, class organization, and methods of spotting for safety. (2 1-hour lecture-labs)

140. Coeducational Activities

Upper division credit will be given for PE 40 activities taken after the general education physical education requirement has been met. For list of activities see PE 40.

150. Physical Education Activities

Upper division credit will be given for PE 50 activities taken after the general education physical education requirement has been met. For list of activities see PE 50.

151. Curriculum Development of Physical Education in Secondary Schools (3)

Open to men and women. Prerequisite or concurrently: PE 115A-B-C. Principles applied to the teaching-learning process; organization and observation of physical education activities in the secondary schools; development of physical education programs.

152. Elementary School Physical Education (2)

Open to men and women. Prerequisite or concurrently: E Ed 105; one course in rhythmical activities (for men PE 40-11; for women PE 40-11, 40-16, 40-17) and one course in group games or fundamentals (for men PE 10-1, 10-2; for women PE 50-28). Activities, materials, and methods for teaching physical education in elementary schools based on the California state program. (2 2-hour lecture-labs)

153. Principles of Physical Education (2)

Open to men and women. Prerequisite: PE 30, 151, and senior standing. Principles basic to sound philosophy of physical education for the space age; appraisal of historical development; relationship to health education, recreation, and other areas; foundation and functions of physical education in contemporary American society.

154. Organization and Administration of Physical Education in Secondary Schools (3)

Open to men and women. Prerequisite or concurrently; PE 151. Consideration of classification, scheduling, planning facilities for instruction and recreation; role of the physical education teacher in recreation, equipment, budget, co-curricular program, student leadership, community relationship.

155. Camp Counseling (2)

Open to men and women. For in-service counselors and students wishing summer camp employment. Philosophy, organization, and programs of various types of organized camps; requirements for counselors. Laboratory experiences in program activities, including an overnight class camping trip.

156. Kinesiology, Physiology of Exercise, and Adapted Activities (5)

Open to men and women. Prerequisite: Physio 1, Biol 66. Function and mechanics of human motion; aims, techniques, and procedures in prevention and correction of recognized divergencies; planning, evaluation, and selection of adapted activities suitable for the atypical student.

157. Recreation and Youth Leadership (1-2; max total 4)

Open to men and women. Prerequisite: permission of instructor. Practical experience as assistant leaders of organized children's and youth groups. Weekly conference with instructor.

159. Tests and Measurements (3)

Open to men and women. Scientific testing in physical education; analysis, study, and construction of tests; diagnosis of physical efficiency and physiological reactions to exercise, sports, and games.

162. Dance Choreography (1-2; max total 4)

Prerequisite: two semesters of modern dance and Orchesis membership, or equivalent, or permission of instructor. Planning and direction of dances for public programs.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

201. Physical Education Facilities and Equipment (2)

Open to men and women. Functional planning of indoor and outdoor physical education facilities and equipment for schools and recreational centers; design and construction of facilities for a complete physical education program; survey of school plants in the San Joaquin Valley.

202. Seminar in Program Development (2)

Open to men and women. Prerequisite: PE 151 or permission of instructor. Projects in the development of secondary school physical education programs, program construction and evaluation.

209. Problems in Secondary School Physical Education (2)

Open to men and women. Physical education problems in activity program; athletic program; intramural program; recreation program (including camping); and health instruction.

220. Research in Education (2) (See A Ed 220)

254. Seminar in Physical Education Administration (2)

Open to men and women. Current problems and practices in organization and administration of physical education programs in secondary schools.

272. Problems in Body Mechanics (2)

Open to men and women. Prerequisite: PE 156, S Ed 166; or permission of instructor. Analysis of posture and body mechanics; methods and techniques for examination and treatment of faulty body mechanics; practice in exercises for achieving and maintaining correct body mechanics.

273. Problems in Analysis of Athletic Performance (2)

Open to men and women. Analysis of performance in various sports; application of fundamental laws of physics and principles of the physiology of muscular activity to human performance.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis or Project (2-4; max total 4)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

PHYSICAL SCIENCE DIVISION

Division Head ..... Frederic A. Scott

Department	*Chairman*
Chemistry	Warren R. Biggerstaff
Geography	Chester F. Cole
Geology	George M. Stanley
Mathematics	Anthony E. Labarre, Jr.
Physics	Frederic A. Scott

The Physical Science Division includes five departments with common objectives and interests, quantitative and scientific thinking predominating. The division prepares for positions in industry, government, engineering, and science fields; scientific research; and teaching. It provides a general background for this scientific age.

The division offers majors and minors for the bachelor of arts degree in all departments; bachelor of science degree in chemistry, geology, mathematics, and physics; master of arts degree in geography, mathematics, and in physics; master of science degree in chemistry, mathematics, and physics; and teaching credentials.

Chemistry 260
Geography 265
Geology 269
Mathematics 272
Physical Science 278
Physics 279

CHEMISTRY DEPARTMENT

(In the Physical Science Division)

Professors: Biggerstaff (Chairman), Bremner, Clark, Kallo, Womack
Associate Professors: Burtner, G. Kauffman
Assistant Professors: Bluestone, Ciula, W. Miller, Russell, Vavoulis
Part-time: Cheng, Koligian, Mitchell, Nakuguchi

The Chemistry Department provides (1) undergraduate training in chemistry for students planning professional careers in chemistry and allied professions, and for those contemplating graduate work for advanced degrees; (2) participation in the preparation of teachers of chemistry and the other physical sciences in the teaching credential programs; (3) 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; (4) stimulation of interest in and understanding of the achievements and contributions of chemistry to our civilization for non-science students, as a part of general education; and (5) graduate instruction in chemistry for the master of science degree for those students and teachers desiring to improve their qualifications as teachers in secondary schools and junior colleges, or for employment in the chemical industries, or as preparation for further advanced study.

The Chemistry Department is approved by the American Chemical Society. Students who satisfactorily complete the program for the bachelor of science degree in chemistry will be 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.

HIGH SCHOOL PREPARATION

The high school preparation for majors in the chemistry department should include: algebra (2 years), plane and solid geometry, trigonometry; chemistry or physics; German (2 years).

Prospective chemistry majors are urged to take the general chemistry placement test prior to college entrance. A satisfactory score in this test will permit the student to start the chemistry course sequence with Chem 1B.

MAJORS

For the bachelor of arts degree a major in chemistry consists of 37 units as listed below. For the bachelor of science degree, a major in chemistry consists of 46 units as listed below. Upper division students having a grade average of B or higher in their major courses are encouraged to elect Chem 190, Independent Study, in order to acquire first-hand experience in a research project.

Foreign Language Requirement

German 1A-B and 61, or equivalent, are required for bachelor of science degree majors in chemistry. See the general statement under *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

BACHELOR OF ARTS DEGREE IN CHEMISTRY

	Units
General Education	45
Chemistry Major	37
Chem 1A-B, 6, 28, 29, 106, 110A-B, 111A-B, 128, 129	
Additional Requirements	21
Math 3, 4, 6, Physics 2A-B	
Electives	21
Recommended: Chem 99	
	124

BACHELOR OF SCIENCE DEGREE IN CHEMISTRY

General Education	45
Chemistry Major	46
Chem 1A-B, 6, 28, 29, 106, 110A-B, 111A-B, 122, 128, 129	
Elect 6 units from: Chem 115, 126, 130, 190 (3 un) or a 200 course	
Additional Requirements	30
German 61, Math 3, 4, 6, Physics 4A-B-C	
Physics 102A or other approved u.d. physics or mathematics course	
Electives	7
German 1A-B or equivalent required if not taken in high school	
Recommended: Chem 99	
	128

MINORS

A minor in chemistry for a bachelor's degree requires 19 or 20 units, of which 6 are upper division.

	Units
Chem 1A-B; or 2A-B and 101	9–10
Chem 8, 105, 109	10
	19–20

CREDENTIAL PROGRAM

For information on the credential program consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF SCIENCE DEGREE

The graduate program for the master of science degree in chemistry is based on the equivalent of the undergraduate major at Fresno State College. Twenty of the 30 units required for the degree must be in chemistry. For specific requirements, consult the chairman of the department; for general requirements see *Degrees and Credentials—Master's Degrees*.

FOREIGN LANGUAGE REQUIREMENT

Advancement to candidacy for the master of science degree with a major in chemistry (except for those who have been certified as graduates in Chemistry by the American Chemical Society) requires the passing of an examination demonstrating the ability to read scientific German.

Courses

CHEMISTRY

1A-B. General Chemistry and Qualitative Analysis (5-5)

Chem 1A not open to students with credit in Chem 2A-B. Prerequisite: high school chemistry or physics; advanced algebra or Math B (and a satisfactory score on mathematics proficiency test). Fundamental principles of chemistry; properties of common elements and their compounds; application of the principles of chemical equilibrium to separation and identification of ions. (3 lecture, 6 lab hours)

2A-B. Introductory General Chemistry (3-3)

Prerequisite: high school algebra, plane geometry or Math 28 (concurrently). Composition of matter and physical and chemical changes; fundamental laws and principles; atomic and molecular structure, qualitative and quantitative techniques; introduction to organic chemistry and biochemistry. (2 lecture, 3 lab hours)

6. Quantitative Analysis (4)

Prerequisite: Chem 1B. Introductory principles and methods of quantitative analysis. (2 lecture, 6 lab hours).

8. Elementary Organic Chemistry (3)

Not open to chemistry majors. Recommended for students requiring a rapid coverage of the field. Prerequisite: Chem 1A or 2A-B. Survey of the aliphatic and aromatic compounds of carbon.

28. Introductory Organic Chemistry (3) (Former Chem 128A)

For chemistry majors; recommended for premedical students and other science majors. Not open to students with credit in Chem 8. (Chem 28 and 128 together constitute a year sequence.) Prerequisite: Chem 1A-B or Chem 2A-B. Introductory survey of the reactions of principal functional groups; natural products.

29. Introductory Organic Chemistry Laboratory (2) (Former Chem 129A)

(Chem 29 and 129 together constitute a year sequence.) Prerequisite or concurrently: Chem. 28. Laboratory study of properties and reactions of organic compounds and synthesis of representative compounds. (6 lab hours)

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)

101. Introductory Physical Chemistry (3)

Not open to chemistry majors. Prerequisite: logarithms, elementary algebra; organic chemistry,, quantitative analysis. Kinetic theory of gases, liquids, solutions, buffers, conductance, electromotive force cells, reaction kinetics, colloidal systems, radioactivity, nuclear fission. (3 lecture-demonstration hours)

105. Quantitative Analysis (4)

Not open to chemistry majors. Prerequisite: Chem 1B or 2A-B. Rapid coverage of principles and methods of volumetric and gravimetric analysis. (2 lecture, 6 lab hours)

106. Analytical Chemistry (4)

Prerequisite: Chem 110A, 111A; concurrently Chem 110B, 111B. Principles and methods of qualitative and quantitative analysis of inorganic and organic substances. (2 lecture, 6 lab hours)

109. Elementary Organic Chemistry Laboratory (3)

Not open to chemistry majors. Prerequisite or concurrently: Chem 8. Laboratory study of the carbon compounds with coordinating lectures. (1 lecture, 6 lab hours)

110A-B. Physical Chemistry (3-3)

Prerequisite: Chem 6 or 105, 8 or 28; Physics 4A and B or C, or 2A-B; Math 6. Fundamental laws and theories.

111A-B. Physical Chemical Measurements (1-2)

Accompanies Chem 110A-B. (3 or 6 lab hours)

115. Intermediate Physical Chemistry (3) (Former Chem 118)

Prerequisite: Chem 110A-B. Selected topics in modern physical chemistry. (3 lecture-demonstration hours)

121. Inorganic Preparations (3)

Prerequisite: Chem 6 or 105. Preparation of inorganic compounds; development of technique, use of laboratory instruments; correlation of theory with practice; current literature. (1 lecture, 6 lab hours)

122. Advanced Inorganic Chemistry (3) (Former Chem 120)

Prerequisite: Chem 110A, 111A; concurrently Chem 110B, 111B. General principles; structural and descriptive inorganic chemistry; correlation between observed characteristics and more fundamental properties. (2 lecture, 3 lab hours)

126. Instrumental Methods of Analysis (3)

Prerequisite: Chem 110A, 111A; concurrently Chem 110B, 111B. Physical and instrumental methods of analysis of inorganic and organic substances; instrumental design. (1 lecture, 6 lab hours)

128. Intermediate Organic Chemistry (3) (Former Chem 128B)

Prerequisite: Chem 28 or 8. Continuation of Chem 28. A thorough study of the reactions of aliphatic and aromatic compounds of carbon with emphasis on theory and mechanism.

129. Intermediate Organic Chemistry Laboratory (2) (Former Chem 129B)

Prerequisite: Chem 29 or 109. Continuation of Chem 29 with emphasis on more difficult laboratory techniques and syntheses; introduction to qualitative organic analysis. (6 lab hours)

130. Organic Analysis (3)

Prerequisite: Chem 6, 128, 129. 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)

150A. General Biochemistry (4) (Former Chem 151)

Prerequisite: Chem 8, 105, 109, and one year of general physics. Chemistry of carbohydrates, lipids, proteins, and biochemical regulators; digestion absorption, detoxication, and metabolism. (2 lecture, 6 lab hours)

150B. Clinical Biochemistry (4) (Former Chem 152)

Prerequisite: Chem 150A. Intermediary metabolism; clinical laboratory methods of analysis of tissues and body fluids and their diagnostic value. (2 lecture, 6 lab hours)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

211. Advanced Physical Chemistry (3)

Prerequisite: Chem 110A-B, 111A-B. Topics in physical chemistry selected from thermodynamics, statistical mechanics, kinetics, electrochemistry, phase rule, photochemistry, radioactivity and isotopes, states of matter.

220. Advanced Inorganic Chemistry (3)

Prerequisite: Chem 122. Selected topics; recent developments and current literature; coordination compounds, nonaqueous solvents, unusual oxidation states, and less familiar elements.

226. Advanced Analytical Chemistry (3)

Prerequisite: Chem 110A-B, 111A-B. Theory, application, recent developments and literature of organic and inorganic analysis; topics include instrumental theory, functional group analysis, microchemistry, separations and physical measurements.

230. Advanced Organic Chemistry (3)

Prerequisite: Chem 128, 129. Selected topics in advanced theory and organic reactions with references to current literature.

280. Seminar in Chemistry (1; max total 2)

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis (2-6; max total 6)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

GEOGRAPHY DEPARTMENT
(In the Physical Science Division)

Professor: Cole (Chairman)
Associate Professors: Crosby, Ervin
Assistant Professors: Baker, A. Johnson

For administrative purposes the Geography Department is included in the Physical Science Division; however, the major and most of the courses are counted as social science.

The Geography Department offers a major and a minor in geography for the bachelor of arts degree and a graduate program for the master of arts degree. Geography offerings include undergraduate preparation for careers in regional and urban planning (land use surveys, market area analysis); teaching; map intelligence, real estate, cartography, weather; and preparation for graduate work.

Geography, because it integrates much information from the social and natural sciences and because of the diversity of subject matter from which it obtains data, offers a broad, liberal education applicable to many fields of employment. Geography provides much insight of direct application to teaching various courses of study in the elementary and secondary schools.

BACHELOR OF ARTS DEGREE IN GEOGRAPHY

The bachelor of arts degree with a major in geography consists of 124 units, including 45 units of geography. See requirements listed below. For general degree requirements see *Degrees and Credentials*. Geography courses may not meet the social science general education requirement for geography majors. Two years of one foreign language are recommended for majors intending to do graduate work in geography.

GEOGRAPHY MAJOR	*Units*
Geog 3, 4, 6, 130	9
Elect from: Geog 5, 108, 109, 111, 112, 115, 116, 120, 177, 181, 190, Ag 31, 136, Biol 157, Engr 103, Geol 105, Math 40, Soc 140	20
Elect from: electives listed above, Geog 124, 126, 127, 128, 129, 141, 142, 143, 189	16
	45

Additional Requirements: Introductory course in anthropology, economics, or sociology (may be applied on general education); Geol 1 is required if Geol 105 is selected above.

GEOGRAPHY MINOR	*Units*
Geography 3, 4, 6	7
Elect from: Geog 5, Geog (ud), Biol 157, Geol 105	13
	20

CREDENTIAL PROGRAM

For information on the credential program, consult the departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in geography is based on undergraduate preparation in geography and/or approved related fields. For specific requirements consult the department chairman; for general requirements see *Degrees and Credentials—Master's Degrees*.

Courses

GEOGRAPHY

Note: Geography courses, except Geog 5 and 108, count as social science (not as physical science) in fulfillment of general education requirements.

3. Economic Geography (3)

World distribution of significant commodities, their uses in cultures; agricultural and mineral resource patterns; regionalization of economic activity; implications for contemporary society.

4. World Geography (3)

Not open to students with credit in Geog 2. Cultural and physical features; economic development; resources; man-land relationships. The approach is by continents and/or cultural regions.

5. Meteorology (3) (Former Geol 20)

Weather analysis; factors basic to weather forecasting and climatological studies. (One 2-hour Saturday field trip required)

6. Geography Laboratory (1)

Practical exercises in use of atlas, longitude and latitude, earth-sun relations, time, climatic elements and topographic maps. One two-hour field trip required.

108. Climatology (3) (Former Geol 120)

Prerequisite: Geog 5 or equivalent. Climates of the earth and their significance to man.

109. Natural Vegetation Regions of the World (3)

Prerequisite: permission of instructor. Geographic character, distribution, and environmental relationships of natural vegetational features of the main land masses, land forms, and climatic regions of the world.

111. Map Interpretation (2)

Prerequisite: permission of instructor. Interpretation of foreign and domestic maps; symbols, scale, methods of showing topography, vegetation, culture, land use; soils, water and water levels; characteristics of projections.

112. Aerial Photograph Interpretation (2)

Prerequisite: permission of instructor. Aerial photographs as a means of determining culture, topography, and vegetation; scale, use of index, vertical and oblique photographs, and stereoscopes.

115. Cartography (3)

Use of instruments for drafting and lettering of maps; construction and use of standard map projections; relief representation and map reproduction; cartographic source materials and literature; field trips.

116. Political Geography (3)

Power factors in international relations; concepts of space, resources, industry, agriculture, technology, population, and food supply; cultural groups related to states and their association.

120. Urban Geography (3)

The region as a geographic unit; urban settlements as regional centers; city-region relationships; morphology and structure of villages, towns and cities, and their internal functional relationships; case studies.

124. Geography of the USSR (2)

Regional distribution of resources and industries of the USSR.

126. Australia, New Zealand, and Pacific Islands (3)

Geographic relationship of natural and cultural features to social and economic development.

127. Europe (3)

Geographic regions of Europe emphasizing the relation of human activities to physical factors areal in their distribution and influence.

128. Far East (3)

Regional summary of geographic conditions of countries bounding the Western Pacific; resources and physical conditions influencing political problems.

129. Africa (3)

Systematic survey of Africa; cultural and natural features related to economy of individual countries.

130. Geographic Literature (2)

Prerequisite: geography major or minor. Primary and secondary source materials; literary background of geography.

141. Anglo America (3)

Systematic and regional survey of Anglo America; cultural and physical features related to economy.

142. South America (3)

Relationship of natural and cultural features; economic and social development; man-land relationships. Countries considered individually.

143. Caribbean America (3)

Relationship of natural and cultural features in Mexico, Central American countries, and Caribbean islands and countries; social and economic development; man-land relationships.

177. 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. One week-end field trip required.

180. Field Geography (1-6; max total 6)

Week-end or summer field tours.

181. 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. (Saturdays 4-8 hours)

189. Geography of California (2)

Natural and cultural patterns of California; historical and regional geography of the state.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

205. Seminar in Regional Geography (3)

Prerequisite: 9 units of upper division geography or permission of instructor. Theories of regional geography; method in regional delimitation; applied regional geography.

215. Advanced Cartography (3)

Prerequisite: Geog 115 or permission of instructor. Advanced techniques in planning, compilation, and execution of maps and diagrams; research using primary and secondary source materials; use of advanced cartographic instruments, map reproduction methods.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis (2-6; max total 6)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

301. Recent Interpretations in Geography (2; max total 6 with different topics)

Recent findings in geography and their implications; World, United States, USSR, Europe, or Latin America. Individual reports, papers.

GEOLOGY DEPARTMENT

(In the Physical Science Division)

Professors: Stanley (Chairman), Beard
Associate Professor: Mack
Assistant Professors: Blackerby, Cserna

The Geology Department offers majors in geology for the bachelor of arts degree and for the bachelor of science degree. Geology offerings include undergraduate preparation for professional careers and for graduate work. The introductory course in geology meets a natural science requirement in general education; and courses for earth study as an avocation.

BACHELOR OF ARTS AND BACHELOR OF SCIENCE DEGREES MAJORS IN GEOLOGY

The bachelor of arts degree with a major in geology consists of a total of 124 units including 37 units of geology. The bachelor of science degree with a major in geology consists of a total of 128 units including 45 units of geology. See requirements listed below. For general degree requirements see *Degrees and Credentials.* A student planning graduate study is advised to meet the foreign language requirements of the institution he plans to attend.

Geology Major for BA Degree

	Units
Geol 1, 1L, 2, 12A-B, 101, 105, 106	21
Geol 108 or equivalent summer field course	6
Elect from: Geol 107, 110, 111, 112, 113A-B, 115, 116, 117, 118, 130, 189, 190	10
	37

Additional Requirements: Chem 2A-B or 1A-B; Engr 1, 1L; Math C; Physics 2A-B. Recommended: French, German, or Russian.

Geology Major for BS Degree

	Units
Geol 1, 1L, 2, 12A-B, 101, 105, 106, 107, 110, 112, 113A, 118	34
Geol 108 or equivalent summer field course	6
Elect from: Geol 111, 113B, 115, 116, 117, 130, 189, 190	5
	45

Additional Requirements: Biol 1B; Chem 1A or 2A-B; Chem 1B; Engr 1, 1L; Math 3, 4; Physics 4A-B-C. Recommended: French, German, or Russian.

GEOLOGY MINOR

A minor in geology consists of 14 units (exclusive of Geog 5, 108), of which at least 6 are upper division. It is recommended that Geol 1, 2, 12A-B, 105, and 189 be included in the minor.

CREDENTIAL PROGRAM

For information on the credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

Courses

GEOLOGY

1. Physical Geology (3)

Nature and properties of earth materials and processes involved in development of landscapes; work and effects of streams, waves, glaciers, volcanoes, mountain building, and earthquakes. May include field trips.

1L. Physical Geology Laboratory (1)

Prerequisite: Geol 1 concurrently or permission of instructor. Introductory laboratory study of minerals, rocks, topographic maps, and geologic maps; land forms and geologic structures as shown by maps and models. One-day field trip required. (2 lab hours)

2. Historical Geology (3)

Prerequisite: Geol 1 or equivalent. Survey of earth's history revealed by the rock sequence. May include field trips.

12A-B. Mineralogy (3-2) (Former Geol 12, 13)

Properties, relationships, origin of minerals; form and structure of crystals; determination of common minerals by physical and chemical tests. (Geol 12A: 2 lecture, 3 lab hours. Geol 12B: 1 lecture, 3 lab hours)

25. Engineering Geology (3)

Not open to freshmen. For engineering students. Principles of physical geology; application of geology to engineering structures and projects.

101. Petrology (3)

Prerequisite: Geol 1, 12A-B (or concurrently). Common rock-forming minerals; origin, classification, textures, and structures of igneous, sedimentary, and metamorphic rocks; examination of rocks in the hand specimen. (2 lecture, 2 lab hours)

105. Geomorphology (3)

Prerequisite: Geol 2, or permission of instructor. Land forms, their origin and development; regional problems. May include field trips.

106. Structural Geology (3)

Prerequisite: Geol 2 or permission of instructor. Structural arrangements of rocks; intrusive and extrusive rock structures; folding and faulting; unconformities; applications to geophysical prospecting. May include field trips. (2 lecture, 2 lab hours)

107. Field Geology Methods (2)

Prerequisite: Geol 1, 2, 106, Math C. Field trips to introduce students to methods and instruments used in geologic field work. (1 lecture; field hours—4 weekly until spring vacation, 8-hour Saturday trips thereafter.)

108. Field Geology (6) Summer only

Prerequisite: geology major or permission of instructor. Geologic reconnaissance and application of instrumental methods in geologic mapping and written report of area selected for study.

110. Paleontology (3)

For geology and biology majors. Prerequisite: Geol 2, and either Biol 1B or Zool 1; or permission of instructor. Structures and development of prehistoric animals; invertebrates and index fossils. May include field trips. (2 lecture, 2 lab hours)

111. Stratigraphy (3)

Prerequisite: Geol 2, 101, or permission of instructor. Principles of stratigraphy and of sedimentation as applied to stratigraphy; features, arrangements, fossils, age and distribution of major rock formations of North America. May include field trips.

112. Optical Mineralogy (3)

Prerequisite: Geol 12B or permission of instructor. Optical properties of minerals; identification of selected minerals by optical methods. Manipulation and use of petrographic microscope. (2 lecture, 3 lab hours)

113A-B. Microscopic Petrography (3-2)

Prerequisite: Geol 101, 112. Problems of classification of rocks; thin section study with petrographic microscope of igneous, sedimentary, and metamorphic rocks. (Geol 113A: 2 lecture, 3 lab hours. Geol 113B: 1 lecture, 3 lab hours)

115. Economic Geology (3)

Prerequisite: college chemistry, geology major with senior standing; or permission of instructor. Common earth materials essential in industry; geology, mineralogy, origin, distribution, occurrence, extraction, methods of refining, uses. May include field trips.

116. Petroleum Geology (3)

Prerequisite: Geol 101, 106. Theories of origin of petroleum, petroleum structures, prospecting, extraction methods; selected pertoleum fields. May include field trips.

117. Ground Water (2)

Prerequisite: senior standing or permission of instructor. Geologic and hydrologic factors related to occurrence and utilization of ground water.

118. Advanced Structural Geology (2)

Prerequisite: Geol 106 or permission of instructor. Interpretation of geologic maps; advanced problems in structural geology; stereographic net; structural interpretation from aerial photographs. (1 lecture, 3 lab hours)

130. Advanced Problems in Geology (2)

Prerequisite: senior standing in geology. Topics or problems selected by instructor.

189. Geology of California (2)

Prerequisite: Geol 1. Origin of geological features of the State; relation of structural, stratigraphic, and mineralogical conditions to geologic features and resources of the State.

189L. Geology of California Field Study (1)

Prerequisite or concurrently: Geol 189 or permission of instructor. Field study of selected areas displaying features of the geology of California; written report on each trip. Minimum of 32 hours in field trips required during semester of registration in course; limited to students who can arrange transportation for field trips and share cost.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

MATHEMATICS DEPARTMENT

(In the Physical Science Division)

Professors: Labarre (Chairman), Alkire
Associate Professor: Kipps
Assistant Professors: DiAntonio, Ewy, Falbo, Howes, Robbins, Robinson, Van Zwalenberg, Zane
Part-time: R. F. Arnold, Barnett, Jacobs, Leih

Mathematics serves as a part of general education, as an integral part of technical studies in physical science and engineering, as a foundation in other fields of study, and as a pure science for those interested in mathematics itself and for those who use it in teaching or in some applied field such as statistics, coding and programming for computers, or actuarial work.

HIGH SCHOOL PREPARATION

Most courses in mathematics require a sequence of prerequisites. Students should be sure the prerequisites are met in time to take required courses. Math B and C or equivalent are prerequisite to a major or minor in mathematics. A full four-year sequence of mathematics including equivalents of these courses should be completed in high school.

DUPLICATION OF COURSES

Only in exceptional cases may a student receive credit toward a degree for one course which duplicates one or more courses taken in high school. To receive credit in such a course, a student must obtain written permission from the department chairman prior to enrollment. Under no circumstances can this credit be applied toward the general education requirement. The following are considered duplication:

Math 27, one year high school algebra.
Math 28, one year high school geometry.
Math B, two years high school algebra.
Math C, one-half year high school trigonometry.

No credit will be allowed for Math B, C, 27 or 28 if taken after completion of Math 3 or more advanced mathematics courses.

MAJORS

The Mathematics Department offers majors for the bachelor of arts degree and the bachelor of science degree. The bachelor of arts degree is designed primarily for those preparing for graduate study or teaching in mathematics. The bachelor of science degree is intended to prepare those who plan to enter industrial or other applied areas. Any student planning advanced study is advised to meet the foreign language requirement of the school he plans to attend.

Mathematics Major for BA Degree	*Units*
Math 3, 4, 6, 7, 106 or 109, 114, 118A-B, 119	31
Elect from: Math (u.d.), Physics 105A-B or 170A-B	5
	36

Mathematics Major for BS Degree	*Units*
Math 3, 4, 6, 7, 107 or 109, 114, 117 or 119, 121	25–28
Math 118A-B	3–6
Elect from: Math (u.d.), Physics 105A-B or 170A-B	8–2
	36

Additional Requirements: Physics 4A-B-C, Chem 1A-B or 1A, 8.

MATHEMATICS MINOR

The minor in mathematics includes 20 units of mathematics courses, excluding Math B, C, 27, 28. Consult the department chairman for course requirements.

CREDENTIAL PROGRAM

For information on the credential program consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division.* Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS AND MASTER OF SCIENCE DEGREES

The graduate programs in mathematics for master's degrees are based on the corresponding undergraduate programs at Fresno State College. Math 114, 115, 118A-B, and 119 must be completed if not taken in the undergraduate program. In addition, master of arts degree candidates must include Math 110 or 200. For additional information consult the department chairman; for general requirements see *Degrees and Credentials—Master's Degrees.*

Foreign Language Requirement

Advancement to candidacy for the master of arts degree with a major in mathematics requires two years of satisfactory collegiate study (or the equivalent) in one foreign language. The foreign language requirement may be met by the passing of a proficiency examination.

Courses

MATHEMATICS

B. Intermediate Algebra (3)

Prerequisite: elementary algebra and geometry. Sets, functions, graphs, quadratic equations, inequalities, simultaneous equations, matrices and determinants, mathematical induction, binomial theorem, progressions, exponents and logarithms. (See *Duplication of Courses.*)

C. Trigonometry (3)

Prerequisite: Math B. 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.*)

2. Mathematics of Finance (3)

Prerequisite: Math B or 2 years high school algebra. Development of mathematical relations between investment and income; compound interest, annuities, sinking fund, depreciation, amortization, and bonds.

3. Mathematical Analysis I (5)

Prerequisite: two years of high school algebra, one year of plane geometry, trigonometry. Analytic geometry, limits and derivatives, applications of differentiation, differentials, elementary transcendental functions, the definite integral.

4. Mathematical Analysis II (5)

Prerequisite: Math 3. Definite integrals, indefinite integrations, vectors, polar coordinates, solid analytic geometry, multiple integrals.

6. Mathematical Analysis III (3)

Prerequisite: Math 4. Partial derivatives, line integrals, Green's theorem, Taylor's theorem, L'Hospital's rules, sequences, convergence tests for infinite series, introduction to differential equations.

7. Intermediate Mathematical Analysis (3)

Prerequisite: Math 6. The complete ordered field and its usual topology; extensions to the plane; continuity and uniform continuity; the implicit function theorem and applications; surface integrals.

27. Elementary Algebra (3)

Transition from arithmetic to symbolism and generalization of algebra, fundamental operations, equations, formulas, sets, graphs. (See *Duplication of Courses.*)

28. Plane Geometry (3)

Prerequisite: Math 27. Points, lines, angles, triangles, polygons, circles; axioms, theorems, problems; proofs and constructions. (See *Duplication of Courses.*)

40. Introduction to Statistical Methods (3)

Not open to students with credit in Math 107, 109. Prerequisite: Math 27, 28. Organization of data, descriptive measures, sampling, statistical inference, testing hypotheses, chi-square, correlation and regression.

101. Principles of Geometry (3)

Prerequisite: Math 3. Fundamental concepts of synthetic geometry from the modern point of view; axioms of collinearity, order, congruence; theorems of Ceva, Menelaus, Desargues; loci; transformations of the plane; selected topics from geometry of the circle and triangle.

102. Principles of Algebra (3)

Prerequisite: Math 4. Integral domains; ordered fields; rational, real, and complex numbers; polynomials and theory of equations.

103. History of Mathematics (3)

Prerequisite: Math 3. Development of mathematics since ancient times; mathematics as a part of the general culture of the periods studied; relationship between mathematics and the physical sciences.

106. Projective Geometry (3)

Prerequisite: Math 101 or 102. Synthetic and analytic projective geometry: axioms; duality; perspective and projective correspondence; harmonic sets; coordinization; projective collineations and correlations; polarities and conics; groups of projective, affine and Euclidean transformations.

107. Probability and Statistics (3)

Prerequisite: Math 4. Introduction to statistics, mathematical development of probability, measures of central tendency and variability, moments, normal distribution, linear correlation.

108. Advanced Statistics (3)

Prerequisite: Math 107. Theory of sampling; problem of estimation; tests of significance; statistical hypotheses; confidence limits; the t, F, and chi-square distributions; analysis of variance and covariance; application of certain tools and techniques.

109. Probability (3)

Prerequisite: Math 6. Classical and axiomatic viewpoints; joint, marginal, and conditional probabilities; Bayes' theorem; repeated trials; convolutions; limit theorems.

110. Symbolic Logic I (3) (See Phil 110)

111. Symbolic Logic II (3) (See Phil 111)

114. Linear Algebra (3)

Prerequisite: Math 102. Group theory; vectors and vector spaces, transformation of coordinates, linear transformations, geometry of real vector spaces; matrices, algebra and matrices, eigenvalues, quadratic forms, unitary and hermitian matrices.

115. Modern Algebra (3)

Prerequisite: Math 114. Determinants and canonical forms; Boolean algebra; partial orderings and lattices; transfinite arithmetic; rings and ideals; algebraic number fields; Galois theory.

116. Theory of Numbers (3)

Prerequisite: Math 3 or 130. Divisibility, greatest common divisor, Euler's function, continued fractions, congruences, quadratic residues, Diophantine equations.

117. Advanced Engineering Mathematics (3)

Prerequisite: Math 6. Vectors and matrices; introduction to ordinary differential equations, Laplace transforms, orthogonal functions, Fourier series; introduction to functions of a complex variable; partial differential equations.

118A-B. Advanced Calculus (3-3)

Prerequisite: Math 7. The real number system; function theory, continuity, differentiability; partial differentiation; multiple integrals; line and surface integrals; Fourier series and integrals; infinite series.

119. Differential Equations (3)

Prerequisite: Math 6, Physics 4A. Definition and classification of differential equations; general, particular, and singular solutions; existence theorems; theory and technique of solving certain differential equations; applications.

121. Numerical Analysis (3)

Prerequisite: Math 6, 102. Finite difference and Lagrangian interpolation formulas; numerical solution of equations, systems of equations, and differential equations.

122. Partial Differential Equations (3)

Prerequisite: Math 118A, 119. 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.

130. Introduction to Modern Mathematics (3)

Prerequisite: Math B. Logic, set theory, probability, linear programming, Markov chains, applications to economics, psychology, and sociology.

131. Game Theory and Linear Programming (3)

Prerequisite: Math 130 and permission of instructor; or Math 4. Games of strategy, normal form of a game, minimax theorem for two-person games, n-person games, solutions of n-person games and equilibrium points, linear programming, applications.

140. Arithmetic and Algebra of the Rational Number System (3)

Meets general education mathematics requirement for elementary credential candidates; not open to students with credit in Math 10. Prerequisite: elementary algebra and geometry. Development of the rational number system and its subsystems from the informal point of view; sets, relations and operations, equivalence classes; definitions of number systems, isomorphism; algorithms for operations with numbers; prime numbers and divisibility; ratios; applications.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200. Foundations of Mathematics (3) (Same as Phil 200)

Prerequisite: Math 102 or 110 or permission of instructor. Mathematical logic with applications to the development of the real number system and philosophy of mathematics.

202. Fundamental Concepts of Mathematics (3)

Prerequisite: Math 6 or 7. Fundamental notions regarding number theory, number system, algebra of number fields; functions, limits, calculus, and differential equations. Primarily for those planning to teach mathematics.

205. Functions of a Complex Variable (3)

Prerequisite or concurrently: Math 118A. Analytic functions, conformal mapping, analytic continuation, meromorphic functions, contour integration and the residue theorem, Laplace transform.

207. Real Variables (3)

Prerequisite or concurrently: Math 118B. Theory of sets; cardinals; ordinals; function spaces, linear spaces; measure theory; theory of modern integration and differentiation.

211. Point Set Topology (3)

Prerequisite or concurrently: Math 205 or 207. 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.

215. Differential Geometry (3)

Prerequisite or concurrently: Math 118B or 122. 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.

221. Advanced Numerical Analysis (3)

Prerequisite: Math 121. Linear equations and matrices; parabolic, hyperbolic, and elliptic differential equations; principles of coding and programming of computers.

231. Rings and Fields (3)

Prerequisite: Math 115. Sets, groups, groups with operators, rings, fields, factorization, Galois theory.

232. Linear Algebra (3)

Prerequisite: Math 231. Modules, representation theory, ideal theory, polynomial ideals, real fields.

241. Seminar (3)

Prerequisite: two graduate courses in mathematics. Presentation of current mathematical research in field of student's interest.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis (2-6; max total 6)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

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.

PHYSICAL SCIENCE

(In the Physical Science Division)

Some of the departments within the Physical Science Division offer courses in the physical science area. These courses may be used to satisfy requirements for general education, credential programs, or professional development.

Courses

PHYSICAL SCIENCE

10. Introduction to Physical Science (3) (Former Phy Sc 10A)

Not open to students with credit in college physics. Prerequisite: one year of high school algebra or equivalent. Elementary astronomy and physics; mechanical, magnetic, and optical principles; application to everyday experiences. Lecture, demonstration.

12. Introduction to Physical Science (3) (Former Phy Sc 10B)

Not open to students with credit in college chemistry. Prerequisite: one year of high school algebra or equivalent. Fundamental concepts of chemistry, principles and their applications, contributions of chemical sciences and engineering to everyday living. Lecture, demonstration.

21. Elementary Astronomy (3)

Prerequisite: elementary algebra and geometry. Nontechnical fundamental principles and facts of astronomy; appreciation of the wonders of the universe.

106. History and Philosophy of Physical Science (2)

Prerequisite: permission of instructor. Development of physical science from the historical standpoint and its significant contributions; philosophy of science, nature of reality, principle of causality, role of definitions in science, uncertainty and measurements, rise and decline of the mechanical view, epistemology.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

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 see below)

Maximum total credit 12 units; not more than 6 units in one field. Prerequisite: elementary school 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.

PHYSICS DEPARTMENT

(In the Physical Science Division)

Professors: Scott (Chairman), Eliason
Associate Professors: S. Brown, Donaldson, Shacklett, Shockley
Assistant Professor: J. Billings
Part-time: Lew, Walters

The Physics Department is organized and developed to offer scientific programs leading to various degrees in physics, including the bachelor of arts, bachelor of science, master of arts, and master of science. The programs are arranged to assist in meeting the need for qualified teachers and scientifically trained personnel brought about by the increasing applications of physics to industries, communications, aviation, engineering, national defense and particularly to the research which develops these fields.

HIGH SCHOOL PREPARATION

The high school preparation for majors in the Physics Department should include: algebra (2 years), plane and solid geometry, trigonometry, and chemistry or physics; French, German, or Russian (2 years or more); and mechanical drawing (recommended).

MAJORS

For the bachelor of arts degree a major in physics consists of 37 units of which 25 must be upper division. For the bachelor of science degree, a major in physics consists of 44 units as listed below. For general degree regulations see *Degrees and Credentials.*

Foreign Language Requirement

Two years of satisfactory collegiate study (or equivalent) in French, German, or Russian are required for majors in physics. See the general statement under *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

Degree Curricula	*BA*	*BS*
Physics Major		
Physics 4A-B-C, 102A-B, 105A-B, 107A-B, 110, 110L, 140	37	37
Physics 115, 130A-B	—	7
Additional Requirements		
Chem 1A-B	10	10
Math 3, 4, 6, 7, 118A, and one elective from Math 102, 114, 117, 119	22	22
General Education, Foreign Language*, and Electives	55	52
	124	128

* Courses taken in high school may reduce requirement.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE IN PHYSICS

In addition to the specific courses listed below, general education requirements and electives should be included to bring total to 15-17 units per semester. A total of 128 units must be completed for the bachelor of science degree. (See *Degrees and Credentials.*)

1st Year: Math 3, 4, Physics 4A, F Lang (or equivalent)
2nd Year: Physics 4B-C, Math 6, 117 or 119, Chem 1A-B, F Lang (or equivalent)
3rd Year: Physics 102A-B, 105A-B, 110, 110L, 140, Math 118A-B
4th Year: Physics 107A-B, 115, 130A-B

MINORS

A minor in physics for a bachelor's degree requires 18 units of which 6 must be upper division.

CREDENTIAL PROGRAM

For information on the credential program consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in physics is based on the equivalent of the undergraduate major in physics at Fresno State College. Twenty of the 30 units required for the degree must be in physics. For specific requirements, consult the chairman of the department; for general requirements, see *Degrees and Credentials—Master's Degrees*. See foreign language requirement below.

MASTER OF SCIENCE DEGREE

The master of science degree in physics is designed for graduates who desire to seek industrial employment in physics and allied fields. Undergraduate preparation equivalent to a physics major at Fresno State College is necessary for admission. For specific details of the program, consult the chairman of the department; for general requirements, see *Degrees and Credentials—Master's Degrees*. See foreign language requirement below.

FOREIGN LANGUAGE REQUIREMENT

Advancement to candidacy for the master of arts or the master of science degree with a major in physics requires the passing of an examination demonstrating the ability to read materials of the major in French, German, or Russian.

Courses

PHYSICS

Note: Math 6, Physics 4A-B-C are prerequisite to all upper division and graduate physics courses. No more than 12 units of lower division physics may be applied toward a degree. Associated lecture and laboratory courses must be taken concurrently.

2A-B. General Physics (4-4)

Prerequisite: Math B, 28, or equivalents; satisfactory score on mathematics proficiency test. Mechanics, properties of matter, heat, sound, light, electricity and magnetism, and modern physics. (3 lecture, 3 lab hours)

4A. Mechanics and Sound (4)

Prerequisite: Math 3. Statics, forces, motions, properties of matter, wave motion and sound; solution of problems illustrating principles of mechanics. (3 lecture, 3 lab hours)

4B. Electricity and Magnetism (4)

Prerequisite: Physics 4A, Math 3, 4. Electrostatics, concepts of fields and potential, capacitance, D.C. circuits, chemical and thermal effects, magnetic fields, induced current, alternating current circuits. (3 lecture, 3 lab hours)

4C. Heat, Light and Radiation (4)

Prerequisite: Physics 4A, Math 3, 4. Temperature, calorimetry, heat flow, engine cycles, lenses, mirrors, optical instruments, spectra, atomic structure, radioactivity, X rays, and nuclear physics. (3 lecture, 3 lab hours)

55. Sound (3)

For music students and others interested in the physical basis of music. Vibrations and spectra of various musical instruments; harmony and discord, the tempered scale; acoustics; reproducing instruments; hearing.

102A-B. Modern Physics (3-3)

Prerequisite: Chem 1A or 2A-B. (A) Theoretical and experimental aspects of atomic nature of matter, measurement of electronic charge, conduction of electricity in gases, radiation, photo-electric effect, atom models and spectroscopy. (B) Natural and artificial radioactivity, cosmic rays, fission, fusion, properties of nuclear radiations and their detection.

105A-B. Analytical Mechanics (3-3)

(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. Advanced Electricity and Magnetism (3-3)

Prerequisite: Physics 105A. (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)

Theory of optical phenomena; wave theory of light with applications to optical instruments; interference and diffraction phenomena, dispersion, polarization.

110L. Physical Optics Laboratory (1) (3 lab hours)

115. Introduction to Quantum Mechanics (3)

Prerequisite: Physics 102A, 105A, 110, Math 119. Historical background, postulates, meaning and methods of quantum mechanics; applications to atomic phenomena.

120. Electrical Measurements (3)

Prerequisite: Physics 4A-B-C, Math 6. Theory, operation and use of direct and alternating current measuring instruments. (2 lecture, 3 lab hours)

130A-B. Advanced Laboratory (2-2)

Prerequisite: Physics 102A-B, 105A-B; senior physics major. Advanced experiments in mechanics, electricity and magnetism, atomic and nuclear physics. Opportunity for at least one individual project. (6 lab hours)

140. Thermodynamics and Kinetic Theory (3)

Prerequisite: Math 117 or 119. Fundamental concepts and laws of thermodynamics and kinetic theory with applications.

162. Introduction to Solid State Physics (3)

Prerequisite: Physics 115. 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. Introduction to Mathematical Physics (2-2)

Application of mathematical methods to the solution of problems in physics.

180A-B. Seminar in Physics (1-1)

Prerequisite: senior or graduate physics major or permission of department chairman.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

Note: Preparation equivalent to a physics major at Fresno State College and the permission of the instructor are prerequisite to admission to any of the graduate courses in Physics.

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.

220A-B. Advanced Electricity and Magnetism (3-3)

Electromagnetic theory and its applications; solutions of Laplace's equation; electromagnetic potentials; cylindrical and spherical waves; retarded potentials; Lienard-Wiechert potentials; special relativity and electron theory.

221A-B. Atomic and Nuclear Physics (3-3)

The nature of matter and radiation as deduced from the classical quantum and quantum mechanical theories; atomic and nuclear structure; the nature of the nucleus as deduced from classical, quantum and quantum mechanical theories; models of nuclear structure.

222A-B. Quantum Mechanics (3-3)

223. Statistical Mechanics (3)

Theoretical principles of classical and quantum statistics.

280A-B. Group Study of Selected Topics (3-3)

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

299. Thesis or Project (2-4; max total 4)

Prerequisite: See *Master's Degrees—Thesis Requirements*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

SPEECH ARTS DIVISION

Division Head ..... John W. Wright

The Speech Arts Division prepares for professional, semiprofessional, and technical careers and offers majors and minors for the bachelor of arts degree; teaching credentials; and the master of arts degree.

Speech Arts 284
Dramatic Art
Radio-Television
Speech
Speech Correction-Audiology

SPEECH ARTS DIVISION

Professors: J. Wright (Head), Lombard, C. Taylor
Associate Professors: R. L. Arnold, Burriss, Campbell, Henderson, Walker, D. Wilson
Assistant Professors: Alden, J. Bryon, Fong, G. Graham, A. Kaufman, Loring, Pace, Randall, Walton
Part-time: Anders, Ingram

The Speech Arts Division offers majors for those who plan to make some phase of speech training their profession or vocation as public speakers, book reviewers, play directors, recreational leaders, speech correction specialists, and radio and television production personnel. Students may choose, with guidance, areas of experience to satisfy special needs. For those who intend to make teaching their profession, the division offers programs for public school credentials. The master of arts degree is available under the general provisions listed in this section.

SPEECH TEST

(See *Entrance Examinations*)

MAJORS AND MINORS

The Speech Arts Division offers bachelor of arts degree majors and minors in dramatic art, radio-television broadcasting, and speech (public address communication) with two options. Sp Corr 1X, which may be required for some students, does not count toward a major or minor.

The *dramatic art* major provides training for play directors and playwriters, for community recreational leadership, and for personal development, and is a testing ground for professional theatre ambitions.

The *radio-television broadcasting* major provides training for positions in the radio and television industries and for teachers of radio and television production; and motivation for effective speech training. There are many opportunities in the San Joaquin Valley for persons qualified in radio and television work.

The *speech* major is offered with two options. Option I is designed to provide competencies in public address, communication, and oratory for students preparing for careers in public service, working with relatively mature groups of people. Option II is designed to provide competencies in public address and communication for students who desire careers in public service, working with younger groups of people.

MAJORS

Dramatic Art	*Units*
Spch 10-110, 15-115, 20	7
Drama 33, 34-134, 133, 139, 180, 185A or B	18
Approved electives	11
	36

Radio-Television Broadcasting	
Spch 10-110, 15-115, 20	7
R-TV 40, 41, 44, 141A, 144, 145, 147	18
Approved electives	15
	40

Speech (Public Address-Communication) Option I *Units*

Spch 10-110, 15-115, 20, 24 or 26, 25, 121, 124, 125, 126	25
Approved electives	11
	36

Speech (Public Address-Communication) Option II

Spch 10-110, 20, 24 or 26, 121, 126, 134	17
Drama 137, Sp Corr 151, 157	6
Approved electives	13
	36

MINORS

Dramatic Art

Spch 10-110, 15-115, 20	6
Drama 33, 34-134, 133	9
Approved electives	5
	20

Radio-Television Broadcasting

Spch 15-115	4
R-TV 40, 41 or 44, 147	8
Approved electives	12
	24

Speech (Public Address-Communication) Option I

Spch 15-115, 25, 121, 124, 125 or 126	13
Approved electives	7
	20

Speech (Public Address-Communication) Option II

Spch 20, 121, 126	9
Drama 137, Sp Corr 151, 157	6
Approved electives	5
	20

CREDENTIAL PROGRAM

For information on the credential program consult departmental advisers and see the sections on *Public School Credentials* and the *Education Division*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. Majors and minors must be in subjects normally taught in the public schools.

SPECIALIZED PREPARATION TO TEACH EXCEPTIONAL CHILDREN IN THE AREA OF SPEECH AND HEARING HANDICAPPED

The specialized preparation to teach exceptional children in the area of speech and hearing handicapped may be substituted for the requirement of a minor in the standard teaching credential (see *Education Division*). The program also meets the requirements for certification by the American Speech and Hearing Association and is the basis for the undergraduate preparation for the master of arts degree in speech pathology-audiology. For additional information see credential adviser.

	Units
Psych 119, 168	6
Sp Corr 150, 151, 152, 153, 154, 156, 157, 162, 163, 164	23
Approved electives	8
	37
Professional Requirements: Sp Corr 155 (6 un), A Ed 164 (4 un)	10
	47

(Recommended: psychology minor for speech correction-audiology)

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in speech is based on the equivalent of the undergraduate major or minor in speech at Fresno State College. From 18 to 24 of the 30 units required for the degree must be in speech. For specific requirements, consult the head of the division; for general requirements, see *Degrees and Credentials—Master's Degrees.*

Courses

Note: Former Speech courses have been regrouped under Dramatic Art, Radio-Television, Speech, and Speech Correction.

DRAMATIC ART

33. Elementary Techniques of Acting (3)
Fundamental techniques and theories of acting. (3 2-hour lecture-labs)

34. Theatre Craft (3) (Same as IA 34)
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 plays for public performance. (3 lecture-lab and arranged hours)

62. Introduction to Theatre (2) (Same as Engl 62)
Introductory study of the theatre arts; major styles of dramatic composition and production; analysis of representative examples.

131. Playwriting (2; max total 6)
Prerequisite: permission of instructor. Play analysis, exploration of folk material, fundamentals of playwriting, critical analysis and revision of manuscripts, experimental production of completed scripts. (2 lecture-lab and arranged hours)

133. Play Direction (3) (Former Spch 139A)
Prerequisite: Drama 33. Fundamental techniques and theories of stage direction. (3 2-hour lecture-labs)

134. Advanced Theatre Craft (3) (Former Spch 182) (Same as IA 134)
Prerequisite: Drama 34 or permission of instructor. Advanced training in the crafts of technical theatre. (3 lecture-lab and arranged hours)

135. Make-up for Theatre (2)
Theory of make-up for theatre; laboratory applications. (lab hours arranged)

137. Creative Dramatics (2) (Same as E Ed 137)
Basic techniques for the use of dramatization in elementary education; sociodrama, dramatization of school subjects, creative dramatic play.

139. Advanced Acting and Direction (3; max total 6)
Not open to students with 6 units credit in Spch 133 and 139B. Prerequisite: Drama 33 or permission of instructor. Advanced techniques of acting and play direction. (3 2-hour lecture-labs)

159. Children's Theatre (2)
Theories of children's theatre and application to problems in production. (lab hours arranged)

162A-B. Shakespeare (3-3) (See Engl 162A-B)

180. Design in the Theatre (3; max total 9)
Students may not repeat areas taken in former Spch 134A-B, 135A. Prerequisite: Drama 34 or permission of instructor. Theory and laboratory application in scene design, costume, stage and television lighting. (lab hours arranged)

184. Readings in Dramatic Literature (2; max total 6) (Same as Engl 184)
Open to upper division students of all departments. Prerequisite: permission of instructor. Reading and discussion of great plays of history; several plays presented in reading recital. (2 lecture-lab and arranged hours)

185A-B. History of the Theatre (3-3)
(A) History of European theatre and component arts from ancient Greece through the mid-nineteenth century; analysis of representative examples. (B) From Ibsen to the present, including history of theatre in America; analysis of representative examples.

200 series. Graduate courses are listed under *Speech.*

RADIO-TELEVISION

40. Introduction to Radio and Television Broadcasting (3)
Radio and television as media of mass communication; practice in application of oral and visual techniques to the broadcast situation.

41. Elementary Radio Production (3)
Prerequisite: R-TV 40. Director's techniques and tools; microphone setups, sound effects, music, script analysis, casting, control operation, and oral techniques. (3 lecture-lab and arranged hours)

44. Elementary Television Production (3)
Prerequisite: R-TV 40. Fundamentals of television broadcasting techniques and program planning. (2 lecture and arranged hours)

128. Motion Picture Evaluation (2)
Criteria for motion picture selection; use of reviews and judgment by critics and organizations; critical observation; appreciation and enjoyment. (2 lecture-lab and arranged hours)

129. Telefilm Production (2; max total 4)
Prerequisite: R-TV 128, permission of instructor. Theoretical and practical application of visualization techniques as applied in the media of television film. (lab hours arranged)

141A-B. Radio and Television Continuity Writing (3-3)
Prerequisite: Engl 1. Application of principles of creative writing to radio and television broadcasting; analysis and writing of radio and television plays; writing skills and standards of criticism. (3 lecture-lab and arranged hours)

142. Radio and Television News Broadcasting (2) (Same as Jour 142)
Prerequisite: Engl 1; Jour 114. All aspects of radio and television news broadcasting; analysis and use of the techniques in editing and writing. (2 lecture-lab and arranged hours)

143. Radio and Television in Education (2) (Same as A Ed 143)
Philosophy, objectives, and uses of radio and television in education; place of radio and television in the curriculum, classroom utilization, out-of-school listening and viewing; advantages and limitations of the media; evaluation of school broadcasts; program planning.

143L. Radio and Television Education Laboratory (1) (Same as A Ed 143L)
Prerequisite or concurrently: R-TV 143. Experience in production of educational radio and television programs.

144. Advanced Television Production (2)
Prerequisite: R-TV 44. Organization and planning of the television production. (2 lecture-lab and arranged hours)

145. Radio and Television Station Operation and Programming (2)
Prerequisite: R-TV 44. Organization, management, and programming of radio and television stations; correlation of department functions; rules and regulations governing station operation. Experience in simulated broadcasts; apprenticeships in local stations. (2 lecture-lab and arranged hours)

147. Radio and Television Direction (2; max total 8)
Prerequisite: R-TV 41 or 44, permission of instructor. Radio direction: planning and organization of production elements and direction of radio programs for broadcast over local stations. Television direction: planning and organization of production elements and direction of television programs on closed-circuit and over local stations. (lab hours arranged)

149. Radio and Television Announcing (2)
Prerequisite: R-TV 44. Development of professional radio and television announcing skills; participation in radio and television broadcasts over local commercial stations. (2 lecture-lab and arranged hours)

200 series. Graduate courses are listed under *Speech*.

SPEECH

10. Administration of Speech Arts Programs (2)
Organization and management of public events in speech arts. (2 lecture-lab and arranged hours)

15. Speech Arts Laboratory (1-2; max total any area 4)
Prerequisite: permission of instructor. Group laboratory experience in major presentations and programs for theatre, radio-television, and forensics. (lab hours arranged)

20. Fundamentals of Voice and Expression (3)
Diagnosis and improvement of voice and expression habits; building of confidence through a variety of speech experiences.

21. Fundamentals of Oral Communication (3)
Meets speech requirement in general education. Understanding and practicing the skills of oral communication; observation, organization, reasoning, semantics, transmission, listening, and problem solving.

22. Fundamentals of Interpretation (3)
Basic concepts of interpretative reading.

24. Persuasion (3)
Prerequisite: Spch 21 or permission of instructor. Persuasion viewed as a social tool for resolving controversy and forming opinions.

25. Argumentation (3)
Prerequisite: Spch 21 or permission of instructor. Logical analysis, evidence, reasoning, and proof used in arriving at rational decisions.

26. Group Discussion (3)
Prerequisite: Spch 21 or permission of instructor. Oral communication in the dynamics of group thinking and problem solving.

76. Mechanics of Oral Expression (2)
For prospective teachers; open to others. Intensive drill in voice and reading techniques. (2 lecture-lab and arranged hours)

110. Administration of Speech Arts Programs (2; max total 4)
Organization and management of public events in speech arts. (2 lecture-lab and arranged hours)

115. Advanced Speech Arts Laboratory (1-2; max total any area 6)
Prerequisite: permission of instructor. Group laboratory experience in major presentations and programs for theatre, radio-television, and forensics. (lab hours arranged)

121. Advanced Oral Communication (3)
Prerequisite: Spch 21 or permission of instructor. Study and application of the theories of oral communication at an advanced level.

122. Interpretation (3)
Advanced oral interpretation of literature.

124. History of Public Address (3)
History and criticism of the world's great speakers within the context of political, social, and economic issues.

125. Rhetorical Theory (3)
Study of rhetorical principles for the purpose of establishing standards for the evaluation of speech making.

126. Group Communication (3)
Prerequisite: Spch 21 or permission of instructor. Analysis of the interrelationships of social groups and communication processes.

127. Dynamics of Leadership (2)
Theory and practice of leadership in various types of organization; functions of leadership in group dynamics.

130. Choral Reading (2; max total 4)
Selection of poetry appropriate for choral reading on various educational levels; role of choral reading in speech teaching.

134. Structure of English (3) (See Engl 134)

135. Introduction to Linguistics (3) (See Ling 135)

137. American English (3) (See Engl 137)

158. Speech for the Classroom Teacher (3) (Same as E Ed 158)
Prerequisite: permission of instructor. Speech needs of teachers; management of speech activities in the classroom; diagnosis of student speech difficulties and techniques for alleviating deficiencies.

189. Projects in Production (2; max total any combination 6)
Prerequisite: permission of instructor. Individual projects in all phases of production in laboratory theatre, local radio and television stations, and forensics. (hours arranged)

190. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES
(See *Course Numbering System—Definitions and Eligibility*)

200. Introduction to Graduate Study (2)
Prerequisite: speech minor or equivalent. Seminar in research procedures and materials in speech. Required of all majors in speech arts during the first semester of graduate work.

210. Graduate Survey in Speech Arts (2)
Prerequisite or concurrently: Spch 200; permission of instructor. Seminar in review and analysis of advanced literature in an area of specialization.

215. Seminar in Speech Arts (2; max total 8) (Former Spch 222, 224, 239, 244, 247)
Prerequisite: speech minor or equivalent. Research and individually directed work on problems within one area of speech arts: theatre, interpretation, radio-television, public address, and communications.

253. Seminar in Functional Speech Disorders (3; max total 6)
Prerequisite: Sp Corr 153, 155; permission of instructor. Projects in library research or in experimentation relating to functional speech disorders such as articulation, delayed speech, stuttering, and functional voice disorders.

254. Seminar in Organic Speech Disorders (3; max total 6) (Former Spch 223)
Prerequisite: Sp Corr 154, 155; permission of instructor. Projects in library research or in experimentation relating to organic speech disorders such as cleft palate, cerebral palsy, aphasia, and organic voice disorders. (3 lecture-lab and arranged hours)

255. Advanced Clinical Practice (2; max total 4)
Prerequisite: Sp Corr 153, 154, 155; permission of instructor. Supervised clinical practice in diagnosis and therapy of complex speech and hearing problems; causative factors, outlining plan of therapy, counseling parents, referral considerations. (2 lecture-lab and arranged hours)

260. Seminar in Audiology (3; max total 6)
Prerequisite: Sp Corr 164. Projects in library research or experimentation.

290. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study*.

299. Thesis or Project (2-6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

SPEECH CORRECTION

1X. Corrective Speech (2)

Required of students whose speech tests suggest need for special help. May not apply on speech major, minor, or general education. Diagnosis and correction of the more pronounced speech difficulties, individual conferences. (hours arranged)

150. Introduction to Speech Correction (2) (Same as A Ed 150)

Problems of speech correction in education; classification of speech defects, common types, causes and therapeutic procedures; development of normal speech in the child; speech correction in public schools; role of classroom teacher in speech correction program.

151. Phonetics of American English (2)

Study of the speech sounds of American English; discrimination of phonetic elements and transcription of a variety of speech patterns through use of phonetics.

152. Methods in Correction of Speech Defects (2)

Prerequisite: Sp Corr 150, 151. Development of speech correction methods adapted to speech-handicapped child in public school program; observation of clinical practice; planning materials for clinic and school use.

153. Stuttering (2)

Prerequisite: Sp Corr 150, 152 or permission of instructor. Causes and therapy in current use; parent-child relationships; therapeutic approaches to improvement of interpersonal relationships and alleviation of stuttering symptom.

154. Speech Pathology (3)

Prerequisite: Sp Corr 152. Causation and therapy procedures for organic speech disorders, including cleft palate, cerebral palsy, aphasia, voice disorders.

155. Clinical Practice in Speech and Hearing Therapy (2; max total 6)

Prerequisite: Sp Corr 152, permission of instructor. Supervised clinical practice in speech and hearing therapy with a variety of speech and hearing problems; diagnosis of speech deficiencies, procedures of referral to other agencies, parent counseling; case records. (Hours arranged)

156. Voice Science (3)

Prerequisite: Sp Corr 150. Anatomical structures utilized in speech sound production; acoustical properties of sound with respect to pitch, loudness, duration and quality; processes of respiration, phonation, resonance, articulation, including structures involved in each and acoustical modifications that may be effected.

157. Psychology of Speech Development (2)

Psychological principles pertaining to development of speech; stages in development of infant speech; effects of emotion on development of speech patterns and on personality.

162. Principles of Audiology (2)

Anatomy and physiology of the ear; medical aspects of deafness and surgical treatment of hearing loss; psychological and social factors involved; remedial procedures.

163. Lip Reading and Auditory Training (2) (Same as A Ed 151) (Former Sp Corr 161)

Prerequisite: Sp Corr 162 or permission of instructor. Basic principles of establishing communication by observation of visible aspects of speech; methods of teaching lip reading to the acoustically handicapped; recognition and discrimination of speech sounds and speech skills.

164. Audiometry (3) (Former Sp Corr 160) (Same as HEd 164)

Prerequisite: Sp Corr 162 or permission of instructor. Concepts on perception of speech; testing procedures utilized in detection and evaluation of hearing loss; application of testing procedures for diagnostic and rehabilitative purposes.

200 series. Graduate courses are listed under *Speech.*

FACULTY, 1963-1964

Note: Part-time faculty, emeriti, Bakersfield Center staff, and Sudan staff follow this section. Numbers in parentheses indicate year of appointments at Fresno State College.

JOYAL, ARNOLD E. (1948), President
BA, MA, PhD, University of California; LHD, California College of Medicine.

ABOU-GHORRA, IBRAHIM (1956), Associate Professor of Psychology; Counselor
BA, Cairo University; Diploma, Ain Shams University (Egypt); Diploma, Cairo Institute of Higher Studies; MA, Ohio State University; PhD, University of Southern California; Certified Psychologist.

ADDICOTT, IRWIN O. (1934; 1950), Vice President
BA, University of California; MA, BD, Pacific School of Religion; EdD, Stanford University.

ADLER, JACK E. (1961), Assistant Professor of Physical Education
BA, MS, University of Washington.

AHERN, MARY E. (1959), Assistant Professor of Nursing
BS, St. Louis University; Registered Nurse.

AIKEN, JOYCE B. (1956; Spring 1962), Assistant Professor of Art
BA, MA, Fresno State College.

ALBRIGHT, W. DONALD (1958), Dean of Students
BS, Northeast Missouri State Teachers College; MEd, University of Missouri; EdD, Teachers College, Columbia University.

ALDEN, H. LEE, JR. (1960), Assistant Professor of Speech
BA, University of Virginia.

ALDRICH, BEVERLY J. (1957), Psychometrist
BA, University of Nebraska.

ALDRICH, LESLIE L. (1955), Assistant Professor of Industrial Arts
BA, Willamette University; MA, Oregon State College.

ALEXANDER, MICHAEL J. (1963), Lecturer in Business Administration
CSB, School of Commerce (Bulgaria); MFA, Institute of Finance and Administration (Bulgaria); PhD, College of Intern's Commerce (Austria).

ALKIRE, G. DON (1953), Professor of Mathematics
BA, MA, University of South Dakota; EdD, University of Kansas.

ALLEN, DERYLE K. (1961), Test Officer; Coordinator of Faculty Advising
BA, Southwestern State College (Oklahoma); MEd, EdD, University of Oklahoma.

ALLEN, ROGER W. (1959; 1963), Assistant Professor of Business Administration
MBA, University of Chicago.

ANDERSON, MYRON M. (1937), Associate Professor of Physical Education
BA, Fresno State College; MA, University of Southern California.

ANG, HENRY S. (1963), Assistant Professor of Marketing
BS, MBA, University of California; PhD, University of Illinois.

ANGELL, MELVIN A. (1956), Associate Dean of Students (Counseling and Testing)
BA, MA, EdD, University of Washington; Certified Psychologist.

ARCE, GINA (1957), Associate Professor of Botany
BA, MA, George Peabody College; PhD, Vanderbilt University.

ARNOLD, RICHARD L. (1953), Associate Professor of Speech
BA, MA, University of Iowa; PhD, Northwestern University.

AUSTIN, ELLIS T. (1958), Professor of Business Administration
BA, University of Washington; PhD, Michigan State University.

AVERY, GEORGE E. (1959), Assistant Professor of Education
BS, Colorado State University; EdD, University of Maryland.

BADDIN, MELVIN M. (1948), Associate Professor of Music
BM, MMus, Northwestern University

BAILEY, EVA G. (November 1962), Assistant Professor of Nursing
BS, University of Arizona; MS, University of California at Los Angeles; Registered Nurse.

BAKER, VIRGIL R. (Spring 1963), Assistant Professor of Geography
BS, MS, University of Nebraska; PhD, University of Utah.

BAKKEGARD, BENJAMIN M. (1958), Assistant Professor of Music and Education; Laboratory School Teacher
BS, University of North Dakota; MEd, University of Minnesota; EdD, Teachers College, Columbia University.

BALL, WILBUR P. (1958), Senior Vocational Instructor in Agriculture
BS, MEd, Colorado State University; PhD, Iowa State College.

BALLOU, STEPHEN V. (1953), Professor of Education; Chairman, Secondary Education Department
BEd, Duluth State Teachers College; MA, EdD, University of Colorado.

BARNES, ARTHUR P. (1959), Assistant Professor of Music (On leave)
BM, MM, University of Wichita.

BARNHART, KENNETH E., JR. (1958), Professor of Engineering
BS, MS, PhD, University of California.

BARRETT, CAROL E. (1963), Assistant Professor of English
BA, PhD, University of Texas.

BATHURST, LEONARD H., JR. (1954), Associate Professor of Education; Coordinator of Instructional Media Center
BA, MEd, EdD, Pennsylvania State University.

BAUMGARTNER, MARGARET M. (1963), Assistant Professor of Nursing
BS, San Francisco College for Women; MS, University of California at San Francisco.

BEARD, C. NOBLE (1937), Professor of Geology
BA, MA, Indiana University; PhD, University of Illinois.

BEATTY, HAROLD J. (1937), Professor of Physical Education
BA, Fresno State College; MA, University of California.

BEATTY, WILLIAM C., JR. (1947), Professor of Social Science; Chairman, Anthropology-Sociology Department
BA, University of Denver; MA, University of Colorado; PhD, University of Southern California.

BEDROSIAN, SARAH G. (1957; 1962), Assistant Professor of Business Administration (On leave)
BA, MA, Fresno State College.

BEIDEN, J. PETER (1948), Associate Professor of Physical Education
BA, University of Redlands.

BELL, JESSE T. (Spring 1948), Principal Vocational Instructor in Agriculture; Chairman, Animal Science Department
BS, Texas College of Arts and Industries; MA, Sul Ross State Teachers College.

BENNETT, BOB L. (1955), Assistant Professor of Music (On leave)
BA, Fresno State College; MS, Juilliard School of Music.

BERDAHL, ARTHUR C. (1932), Professor of Music
BA, Augustana College; MA, PhD, State University of Iowa.

BERGEY, JOHN (1961), Assistant Professor of Nursing
BS, Yankton College; MA, University of Pittsburgh; Registered Nurse.

BERRY, SARA C. (1957), Librarian II, Laboratory School
BA, Occidental College.

BEVILL, VINCENT D. (1957), Assistant Professor of Engineering
BS, Fresno State College; Registered Mechanical Engineer.

BIEHLER, WAYNE E. (1951), Principal Vocational Instructor in Agriculture; Chairman, Plant Science Department
BS, Fort Hays Kansas State College; MS, University of California (Davis).

BIGELOW, MARION E. (1932), Professor of Physical Education
BS, MS, University of Wisconsin.

BIGGE, MORRIS L. (1950), Professor of Education; Chairman, Advanced Professional Studies Department
BA, Washburn Municipal University; MS, University of Michigan; PhD, University of Kansas.

BIGGERSTAFF, WARREN R. (1948), Professor of Chemistry; Department Chairman
BA, Willamette University; MS, Oregon State College; PhD, University of Wisconsin.

BILDERBACK, DEAN L. (1962), Assistant Professor of History
BA, MA, University of Kansas.

BILLINGS, JAMES J. (1962), Assistant Professor of Physics
BS, University of Arkansas; MS, University of Oklahoma; PhD, University of Texas.

BILLINGS, ROBERT S. (1957), Assistant Professor of English
BA, University of New Hampshire; MA, Boston University; PhD, State University of Iowa.

BIRD, C. WESLEY (1932), Professor of Foreign Languages
BA, MA, Oberlin College; Diplôme, Grenoble University; MA, PhD, Princeton University.

BLACKERBY, BRUCE A. (1963), Assistant Professor of Geology
BA, University of California at Riverside.

BLISS, WILLIAM H. (1950), Professor of Industrial Arts
BS, Central Missouri State College; MA, Colorado State College; EdD, Bradley University.

BLOMGREN, GLEN H. (1962), Assistant Professor of Industrial Arts
BA, MA, Fresno State College.

BLUESTEIN, GENE (1963), Assistant Professor of English
BA, Brooklyn College; MA, PhD, University of Minnesota.

BLUESTONE, SYDNEY (1963), Assistant Professor of Chemistry
BS, Brooklyn College; PhD, Rutgers University.

BOGHOSIAN, ALTOON (1960), Assistant Professor of Nursing
BA, Fresno State College; MS, University of California; Registered Nurse.

BOHMAN, MARLYNN K. (1962), Assistant Professor of Accounting
BS, University of Utah; MBA, University of California; Certified Public Accountant.

BOHNSTEDT, JOHN W. (1956), Assistant Professor of History
BA, Michigan State University; MA, PhD, University of Minnesota.

BOOLSEN, FRANK M. (1948), Professor of Criminology; Department Chairman
BA, MA, University of California.

BOWERS, BILLIE I. (1959), Laboratory School Teacher
BA, Fresno State College.

BRAUN, O. MARTIN (1936), Principal Vocational Instructor in Agriculture
BS, MA, University of California.

BREMNER, RAYMOND W. (1947), Professor of Chemistry
BS, MS, PhD, University of Washington.

BRENGELMAN, FREDERICK H. (1957), Assistant Professor of English
BA, Dana College; MA, University of Nebraska; PhD, University of Washington.

BRENNINGER, RALPH A. (1946), Professor of Foreign Languages
BS, Lafayette College; MA, Columbia University; PhD, University of California.

BREWSTER, MARJORIE A. (1922; 1930), Associate Professor of Education
BA, Fresno State Teachers College; MS, University of Southern California.

BRIGGS, ARLEN J. (1963), Instructor in English
BA, University of California at Los Angeles; MA, University of California.

BRIGHAM, THOMAS M. (1953), Associate Professor of Social Work; Department Chairman
BA, San Francisco State College; MSW, University of California; Registered Social Worker (California).

BROOKS, WAYNE A. (1956), Associate Professor of Business Administration
BA, St. Ambrose College; JD, University of Iowa; LLM, Stanford University; Member, Iowa Bar, California Bar.

BROWN, FORREST D. (1947), Professor of Education
BS, MS, Fort Hays Kansas State College; PhD, University of Cincinnati.

BROWN, SHELDON J. (1956), Associate Professor of Physics
BA, PhD, University of California at Los Angeles.

BRYON, ARTHUR J. (1939; 1947), Professor of Music
Normal Degree, San Francisco Conservatory of Music; BA, Fresno State College; MA, University of California; DMA, University of Southern California.

BRYON, JEANETTE P. (1956), Assistant Professor of Speech
BA, University of Maine; MA, University of North Carolina.

BUCKMAN, KARL E. (1942), Associate Professor of Political Science; Department Chairman
BA, Fresno State College; MA, Claremont Colleges.

BURDICK, DONALD J. (1960), Assistant Professor of Biology
BA, San Jose State College; PhD, University of California.

BURGESS, ROBERT C. (1947), Associate Professor of Physical Education
BA, Fresno State College; MS, University of Southern California.

BURRISS, MERLYN D. (1947; 1953), Associate Professor of Speech
BA, Fresno State College; MA, University of California at Los Angeles.

BURTNER, DALE C. (1958), Associate Professor of Chemistry
BA, Reed College; MS, PhD, University of Washington.

BURTON, BENJAMIN B. (1958), Associate Professor of Psychology
BA, MA, PhD, University of Missouri; Certified Psychologist.

BUSH, P. DALE (1961), Assistant Professor of Economics
BA, MA, University of Denver.

BUTTON, ALAN D. (1961), Assistant Professor of Psychology; Counselor
BS, MA, University of Oregon; PhD, Stanford University.

CADY, DOROTHY A. (1954), Laboratory School Teacher
BS, University of Minnesota; BA, MA, Fresno State College; Registered Nurse.

CAMMACK, CHRISTOPHER, Major USAF (1962), Assistant Professor of Air Science
BA, MA, Jackson College (Hawaii).

CAMPBELL, HOWARD J. (1946), Associate Professor of Speech
BS, North Texas State Teachers College; MA, Stanford University; EdD, University of California.

CANALES, JOSE C. (1946), Associate Professor of History (On sabbatical leave fall)
BA, Manhattan College; MA, PhD, University of California.

CARNERO, JUAN J. (1963), Assistant Professor of Foreign Languages
BA, Mexico City College; MA, Middlebury College (Vermont); PhD, University of Madrid (Spain).

CARR, JOHN H. (1953), Associate Professor of Bacteriology
BS, Kansas State Teachers College; MS, PhD, Kansas State College.

CARR, ROBERT A. (1952; 1957), Associate Professor of Business Administration (On leave)
BA, MA, San Francisco State College; PhD, University of Southern California.

CATE, DONALD F. (1962), Assistant Professor of Political Science
BA, Pacific University (Oregon); MA, Oregon State College.

CEHRS, CHARLES H. (1948; 1953), Professor of Engineering
BME, University of Akron; MS, Oregon State College; ME, University of California; Registered Mechanical Engineer.

CHITTICK, ROGER D. (1956), Assistant Professor of English
BA, Butler University; MA, Washington State College; PhD, Stanford University.

CIULA, RICHARD P. (Spring 1961), Assistant Professor of Chemistry
BA, Bowling Green State University; MS, University of California; PhD, University of Washington.

CLARK, DAVID E. (1950; 1953), Professor of Chemistry
BA, University of Redlands; MS, PhD, Stanford University.

COBB, GWENDOLIN B. (1953), Associate Professor of History
BA, MA, PhD, University of California.

COLE, CHESTER F. (1947), Professor of Geography; Department Chairman
BA, Eastern Washington College of Education; MA, Universty of Washington; PhD, University of Nebraska.

COLEMAN, CECIL N. (April, 1959), Professor of Physical Education; Division Head; Athletic Director
BA, MA, Arizona State University.

COLVER, A. WAYNE (1957), Associate Professor of Philosophy
BA, University of California at Los Angeles; MA, PhD, Harvard University.

COMEGYS, ROBERT G. (1955), Associate Professor of History
BA, MA, University of Washington; PhD, Stanford University.

COOPER, ARNOLD M (1957), Assistant Professor of Psychology; Coordinator of Graduate Studies
BA, San Francisco State College; MA, PhD, Claremont Graduate School; Certified Psychologist.

CROSBY, JOHN A. (1956), Associate Professor of Geography
BS, University of Chicago; MA, PhD, University of Washington.

CSERNA, EUGENE G. (Spring 1959), Assistant Professor of Geology
PhD, University of Sciences (Budapest, Hungary); MA, PhD, Columbia University.

DAHLGREN, RUTH O. (1961), Librarian II
BS, Minot State College (North Dakota); MALS, University of Michigan.

DANDOY, MAXIMA A. (Spring 1956), Associate Professor of Education
BSE, National Teachers College (Philippines); MA, Arellano University (Philippines); EdD, Stanford University.

DAUBS, EDWIN H. (1963), Assistant Professor of Biology
BS, MS, PhD, University of Illinois.

DAVIS, IRVING F., JR. (1960), Assistant Professor of Business Administration
BS, University of California; MS, University of Illinois; PhD, University of California.

DAVIS, MARTHA A. (1960), Assistant Professor of Nursing
BS, St. Louis University; MA, Teachers College, Columbia University; Registered Nurse.

DAVIS, VIOLA A. (1955), Counselor
BA, Pasadena College; MA, University of Southern California; PhD, Northwestern University.

DELANEY, VERNE D. (1940), Professor of Music
BM, MA, University of Washington.

DEMING, DONALD E. (1960), Assistant Professor of Engineering
BS, Worchester Polytechnic Institute; MS, University of Connecticut.

DEMPSTER, FRED E. (1951), Associate Professor of Music
BA, University of Omaha; MMus, Northwestern University.

DeTAR, WILLIAM R. (1956), Intermediate Vocational Instructor in Agriculture
BS, MS, University of California (Davis).

DETTINGER, DONALD J. (1947), Associate Professor of Industrial Arts and Education
BA, Chico State College; MS, Oregon State College.

DI ANTONIO, GUS (1961), Assistant Professor of Mathematics
BS, MS, PhD, University of Pittsburgh.

DIENSTEIN, WILLIAM (1946), Professor of Social Science and Criminology
BA, Stanford University; MA, University of California; PhD, Stanford University.

DONALDSON, JOHN R. (1956), Associate Professor of Physics
BS, MA, Rice University; MS, PhD, Yale University.

DOW, VIRGINIA M. (1961), Laboratory School Teacher
BA, Fresno State College.

DOWLER, LLOYD (1948), Head, Agriculture Division; Dean of Farm School
BS, MS, University of Wyoming.

DOYLE, KATHERINE E. (1937), Associate Professor of Physical Education (On leave; retired January 1964)
BA, Stanford University; MS, Wellesley College.

DUKE, JOHN H. (1946), Professor of Journalism
BJ, University of Texas; MA, PhD, University of Southern California.

DUNNING, WILLIAM J. (1947), Professor of Industrial Arts
BS, Iowa State Teachers College; MS, Iowa State College; EdD, University of North Dakota.

EDGAR, MILDRED D. (Spring 1957), Assistant Professor of Elementary Education (Sudan Project 1961–January 1964)
BE, National College of Education (Illinois); MS, Syracuse University.

EHLERS, RONALD H. (1963), Assistant Professor of Music
BA, San Jose State College; MS, Juilliard School of Music.

ELGORRIAGA, JOSE A. (1962), Assistant Professor of Foreign Languages
BA, Fresno State College; MA, PhD, University of California at Los Angeles.

ELIASON, AFTON Y. (1935), Professor of Physics
BS, Utah State Agricultural College; MA, PhD, University of California.

EMERSON, JOHN T. (1959), Assistant Professor of Business Administration; Coordinator of Computer Center
BA, JD, University of Chicago.

ENSSLIN, WALTER (Spring 1959), Assistant Professor of Foreign Languages
PhD, University of Berlin.

ERMOIAN, SARAH M. (1963), Instructor in Nursing
BS, Fresno State College; Registered Nurse.

ERVIN, ROGER E. (1957), Associate Professor of Geography
BA, MA, University of Washington; PhD, University of Florida.

EVANS, RALPH F. (1947), Professor of Education (Chief of Party, Sudan Project, March 1963–64)
BEd, Eastern Illinois State Teachers College; MA, PhD, State University of Iowa.

EVANS, RONALD L. (1963), Assistant Professor of Biology
BA, MA, University of Toronto; PhD, Stanford University.

EVANS, THOMAS H. (1963), Professor of Engineering; Division Head
BS, MSCE, California Institute of Technology; Registered Professional Engineer.

EVERETT, MILES C. (1963), Instructor in History
BA, University of California (Davis); MA, University of California.

EVERWINE, PETER P. (1962), Assistant Professor of English
BS, Northwestern University; PhD, State University of Iowa.

EWY, DANIEL J. (1951; 1955), Assistant Professor of Mathematics
BA, University of California; MS, Stanford University.

FALBO, CLEMENT E. (1963), Assistant Professor of Mathematics
BA, MA, PhD, University of Texas.

FALK, DORIS F. (1946), Professor of Biology (On leave)
BA, MA, PhD, University of California.

FALK, KARL L. (1938), Professor of Economics (On leave; CSC Overseas Program 1963-64)
BA, Stanford University; PhD, University of Berlin.

FAST, PETER G. (1957), Associate Professor of Education
BA, Goshen College; MA, Ball State Teachers College; EdD, Indiana University.

FEE, JAMES A. (1957), Assistant Professor of Education
BS, Northeastern State College (Oklahoma); MA, Stanford University; EdD, University of Oklahoma.

FEUCHES, CONRAD (1946), Associate Professor of Industrial Arts
BA, Fresno State College; MS, Oregon State College.

FIKES, JAMES A. (1955), Associate Professor of Health Education
BS, Central State College (Oklahoma); MPH, MEd, PhD, Oklahoma University.

FISHER, M. BRUCE (1941), Professor of Psychology (On leave)
BA, University of California; PhD, Yale University; Certified Psychologist.

FISK, McKEE (1948), Professor of Business Administration; Head, Business Division
BA, Oklahoma City University; MA, University of Southern California; PhD, Yale University.

FOIN, OWEN F., JR. (1942), Associate Professor of Engineering
BA, Fresno State College; Registered Electrical Engineer.

FONG, RAYMOND G. (1963), Assistant Professor of Speech
BA, Stanford University; MA, Sacramento State College.

FRICKER, HENRY F. (1952), Professor of Health Education and Education; Chairman, Health Education Department
BA, Marshall College; MA, EdD, Stanford University.

FROSCHER, JEAN L. (January 1963), Librarian II
BA, Florida State College for Women; MA, Florida State University.

GARDNER, FANNIE L. (1959), Associate Professor of Nursing; Department Chairman
BS, MEd, University of Houston; Registered Nurse.

GAYLORD, EDWARD H. (1957), Assistant Professor of Engineering
BS in EE, Colorado State University; MS in EE, University of Colorado; Registered Electrical Engineer.

GERARD, MARIAN M. (1949), Laboratory School Teacher
BA, Mills College; MA, Fresno State College.

GILBERT, WILLIAM R. (1955), Associate Professor of Education
BS, BS, MS, University of Illinois; PhD, University of Washington.

GLEASON, KENNETH C. (1946), Associate Professor of Physical Education
BA, Fresno State College; MS, University of Southern California.

GLIM, ROBERT J. (1948), Principal Vocational Instructor in Agriculture (Sudan Project 1961-64)
BS, MEd, University of California (Davis).

GONSER, MARTIN E. (1958), Assistant Professor of Industrial Arts
BS, MS, Kansas State Teachers College.

GRAHAM, GAYLORD O. (1957), Assistant Professor of Speech
BA, MA, State University of Iowa.

GRAHAM, HERMAN D. (1947), Professor of Economics (On leave)
BEd, Illinois State Normal University; MA, PhD, University of Illinois.

GREEN, WILLIAM A., JR. (1963), Assistant Professor of History
BA, University of Delaware; MA, PhD, Harvard University.

GREENE, ELEANORE R. (1960), Assistant Professor of Nursing
BA, Cornell University; MA, Columbia University; Registered Nurse.

GRIFFITHS, I. ACE (1959), Assistant Professor of Education
BS, University of Idaho; MS, University of Arizona; EdD, Colorado State College; Certified Psychologist.

GROSS, PHYLLIS P. (1963), Lecturer in Biology
BA, San Jose State College; MA, Stanford University.

HADSALL, LEO F. (1932), Professor of Biology
BA, MA, Bucknell University; PhD, Cornell University.

HAGGBLADE, BERLE (1963), Assistant Professor of Office Administration
BA, State College of Iowa; MA, Colorado State College.

HAIMBACH, DAVID (1959), Associate Professor of Education; Principal, Laboratory School
BSEd, EdM, Temple University; EdD, University of Florida.

HAIRABEDIAN, ARA (1953), Associate Professor of Physical Education; Department Chairman
BS, University of Southern California; MEd, Pennsylvania State College.

HALE, HARRY J., JR. (1963), Assistant Professor of Sociology
BA, Fresno State College; PhD, University of Tennessee.

HALL, LLOYD A. (1960), Physician
BA, MD, Stanford University.

HALPER, DONALD G. (1955), Associate Professor of Marketing (On leave)
BA, MS, University of Illinois; PhD, Stanford University.

HAMPTON, ROBERT E. (1956), Associate Professor of Marketing
BBA, Golden Gate College; MA, Chico State College; EdD, Stanford University.

HANNER, J. FLINT (1925), Professor of Physical Education
BA, MA, Stanford University.

HANSEN, JULIA A. (1962), Assistant Professor of Nursing
BA, University of Redlands; BA, Stanford University; MN, University of Washington; Registered Nurse.

HARLAN, RONALD J. (1956), Librarian II
BA, Fresno State College; MLS, University of California.

HARRISON, RAYMOND H. (1955), Professor of School Administration
BS, Central State College; MS, Oklahoma State University; EdD, University of Denver.

HARRISON, ROBERT D. (1954), Intermediate Vocational Instructor in Agriculture
BS, University of Michigan; MS, Michigan State College.

HARTON, JOHN J. (1941), Professor of Education
BA, Hendrix College; MA, George Peabody College; PhD, Duke University; Certified Psychologist.

HASHMI, SAJJAD A. (Spring 1964), Assistant Professor of Business Administration
BA, University of Karachi; MA, University of Punjab; PhD, University of Pennsylvania.

HAWBECKER, ALBERT C. (1946), Professor of Biology
BA, Fresno State College; MA, University of California; PhD, Oregon State College.

HECKMAN, FREDRICK G. (1963), Junior Vocational Instructor in Agriculture
BS, MS, New Mexico State University.

HENDERSON, WALLACE D. (1958), Associate Professor of Speech
BA, Fresno State College.

HENFLING, PHYLLIS B. (1940; 1952), Assistant Professor of Education
BA, MA, Fresno State College.

HERBERT, JOHN ED (1928), Professor of Art; Department Chairman
BEd, University of California at Los Angeles; MA, Columbia University.

HIGGINS, FRANCIS V. (1958), Assistant Professor of Engineering
BS, MS, Indiana State Teachers College; MS, University of Michigan; M.S., Case Institute of Technology.

HILLMAN, STEPHANIE (1958), Librarian II
BA, University of California at Los Angeles; MLS, University of California.

HINDMAN, F. SHELDON (1962), Registrar I
BA, University of California.

HIXSON, FLOYD M. (1951), Principal Vocational Instructor in Agriculture
BS, Oklahoma State University; MS, PhD, Kansas State University.

HOLDER, WAYNE B. (1955), Associate Professor of Psychology
BA, MA, New Mexico State University; PhD, University of Missouri.

HOPPING, ANN (1963), Librarian I
BA, Fresno State College; MLS, University of California at Los Angeles.

HOWES, VERNON E. (1956), Assistant Professor of Mathematics
BS, Pomona College; DU, University of Paris.

HOWLAND, RUSSELL S. (1948), Professor of Music
BM, MMus, University of Illinois.

HUNT, MAURICE P. (1948), Professor of Education (On leave)
BS, MA, PhD, Ohio State University.

HUPP, MARGARET M. (1963), Instructor in Physical Education
BS, Purdue University; MS, University of Wisconsin.

HUPPRICH, MABEL (1944), Associate Professor of Physical Education
BS, MS, University of Wisconsin.

ILG, GEORGE F. (1948), Farm Manager; Principal Vocational Instructor in Agriculture
BS, University of California; MS, Ohio State University.

INGLES, LLOYD G. (1945), Professor of Zoology; Head, Life Science Division; Chairman, Biology Department
BA, Redlands University; MA, Claremont Colleges; PhD, University of California.

IRWIN, PHYLLIS A. (1963), Assistant Professor of Music
BS, MEd, University of Houston.

JACOBSEN, ERLAND L. (1959), Librarian II
BA, Stanford University; MLS, University of California.

JARRETT, McRAE (1957), Assistant Professor of Engineering
BS in EE, MS, University of Tennessee.

JARVIS, HELEN W. (1959), Assistant Professor of Home Economics
BA, University of California; MS, Oregon State College.

JASUTIS, CORDELIA (1959), Assistant Professor of Foreign Languages
Lic-es-Let, University of Paris; MA, PhD, State University of Iowa.

JENKIN, SHIRLEY A. (1963), Assistant Professor of Nursing
BSN, Washington State University; MN, University of Washington; Registered Nurse.

JENSEN, CLARENCE D. (1947), Principal Vocational Instructor in Agriculture; Chairman, Agricultural Mechanics Department
BA, Chico State College; MS, Oregon State College.

JEPSEN, VICTOR L. (1946), Professor of Business Administration
BA, MA, University of Oregon; EdD, Stanford University.

JOHNSON, ALAN H. (1963), Assistant Professor of Geography
BS, MA, University of Missouri.

JOHNSON, BIRGER L. (1955), Professor of Physical Education
BA, North Dakota State Teachers College; MS, University of Oregon; PhD, University of Southern California.

JONES, HAROLD D. (1957), Director of Placement
BS, Northern State Teachers College (South Dakota); MEd, University of Colorado; EdD, University of Denver.

JONES, HARRY E. (1957), Associate Dean of Students (Admissions-Records)
BA, San Diego State College; MA, PhD, Claremont Colleges.

JULIANA, JOSEPH R. (1958) Assistant Professor of Physical Education and Recreation
B.S., Temple University; MEd, University of Pittsburgh.

KALLAM, JOHN F. (1962), Assistant Professor of Criminology
BA, San Jose State College.

KALLO, ROBERT M. (1950), Professor of Chemistry
BS, PhD, University of California.

KARLE, HARRY P. (1962), Intermediate Vocational Instructor in Agriculture
BS, Fresno State College; MS, University of California (Davis).

KAUFFMAN, GEORGE B. (1956), Associate Professor of Chemistry (On leave)
BA, University of Pennsylvania; PhD, University of Florida.

KAUFMAN, ALVIN S. (1956), Assistant Professor of Speech
BA, Ohio Wesleyan University; MA, University of Washington.

KECK, HOWARD (1952), Intermediate Vocational Instructor in Agriculture
BS, University of California; MS, University of California (Davis).

KELLOGG, GARY B. (1961), Librarian III
BA, University of Colorado; MA, University of Denver.

KIMBERLY, MAX E. (1958), Assistant Professor of Health Education
BS, MS, Montana State College; MA, EdD, Stanford University.

KINZEL, PAUL F. (1963), Assistant Professor of Foreign Languages
BA, Fresno State College; MA, Columbia University.

KIPPS, THOMAS C. (1956), Associate Professor of Mathematics
BA, MA, PhD, University of California.

KRELL, FRED C. (1963), Assistant Professor of Nursing
BSN, State University of Iowa; MS, Boston University; Registered Nurse.

KREMEN, BENJAMIN G. (1950), Professor of Education
BS, Johns Hopkins; MA, University of Maryland; PhD, Michigan State College.

KRONBACH, GEORGE W. (1963), Assistant Professor of Business Administration
BSBA, MA, University of North Dakota.

KRUEGER, PHILIP C. (Spring 1964), Associate Professor of Physical Education
BS, Southeast (Missouri) State College; MEd, University of Missouri.

KULHAN, EDWARD F. (1956) Associate Professor of Engineering
BS, University of Nevada; MS, Pennsylvania State University; Registered Land Surveyor.

KUPSH, LINZEY, JR. (1962), Assistant Professor of English
BA, Saint Norbert College (Wisconsin); MA, Laval University (Canada); PhD, University of Wisconsin.

LABARRE, ANTHONY E., JR. (1961), Professor of Mathematics; Department Chairman
BE, MS, Tulane University; PhD, University of Oklahoma.

LAMBERT, HAZEL M. (1955), Associate Professor of Education
BA, College of St. Scholastica; BEd, Superior State College; MA, University of Minnesota; PhD, University of North Carolina.

LANDRUM, ELIZABETH A. (1932), Librarian III
BA, Fresno State College; MA, University of California.

LARRABEE, CARLTON H. (1947), Professor of English
BA, Clark University; MA, Harvard University; EdD, New York University.

LATIMER, HOWARD L. (1958), Assistant Professor of Biology
BS, MS, State College of Washington; PhD, Claremont Colleges.

LAURY, FRANK B. (1959) Assistant Professor of Art
BA, Iowa State Teachers College; MA, Stanford University.

LAWTON, ROBERT G. (1959), Assistant Professor of Engineering
BS, MS, University of California.

LEAVENWORTH, RUSSELL E. (1955), Associate Professor of English; Department Chairman
BA, Hanover College; MA, PhD, University of Colorado.

LEAVITT, GEORGE S. (1955), Associate Professor of Psychology
BA, Macalester College; MA, PhD, University of California; Certified Psychologist.

LEERHOFF, RUTH E. (1960), Librarian II
BA, Iowa State Teachers College; MA, University of Denver.

LESLIE, GLENN F. (1958), Professor of Education; Chairman, Elementary Education Department
BS, Central Missouri State College; MEd, EdD, University of Missouri.

LE VALLEY, W. I. LOUIS (1954), Senior Vocational Instructor in Agriculture
BA, Eugene Bible University; BS, MEd, University of California (Davis).

LEVIN, CARL (1942), Business Manager
BA, Fresno State College.

LEVINE, PHILIP (1958), Assistant Professor of English
BA, MA, Wayne University; MFA, State University of Iowa.

LEWIS, KENNETH E. (1956), Coordinator of Financial Aids
BA, MA, Fresno State College.

LEWIS, LETA J. (1963), Assistant Professor of Foreign Languages
BA, University of Washington; PhD, University of California at Los Angeles.

LINDLY, EDITH R. (1948), Professor of Health Education
BS, MS, Oklahoma State University; MPH, University of Michigan; EdD, Oklahoma State University.

LINDQUIST, STANLEY E. (1953), Professor of Psychology
BA, Fresno State College; PhD, University of Chicago; Certified Psychologist.

LIST, EDGAR A. (1961), Assistant Professor of Foreign Languages; Acting Department Chairman
BA, Carroll College; MA, PhD, Yale University.

LOGAN, BARRY L. (1961), Assistant Professor of English
BA, MA, Syracuse University; PhD, Yale University.

LOMBARD, EDWIN H. (1947), Professor of Speech; Television Coordinator
BA, Oberlin College; MA, Columbia University; MA, PhD, Cornell University.

LORING, JANET (1957), Assistant Professor of Speech
BS, Northwestern University; MA, University of Kansas City; PhD, State University of Iowa.

LOWE, HERBERT F. (Spring 1957), Assistant Professor of Engineering
BS, California State Polytechnic College; MS, Stanford University; Registered Civil Engineer.

LUNDBERG, JAMES B. (1960), Assistant Professor of Education
BS, North Texas State College; MA, Michigan State University.

LYON, EARL D. (1938), Professor of English
BA, University of California at Los Angeles; MA, PhD, University of California.

MACH, LELAND E. (1958), Associate Professor of Education
BA, Colorado State College of Education; MA, Northwestern University; EdD, College of the Pacific; Certified Psychologist.

MACK, SEYMOUR (1957), Associate Professor of Geology
BS, College of the City of New York; MS, PhD, Syracuse University.

MADDEN, HARRISON E. (1956), Associate Professor of Psychology (On leave; sabbatical, fall)
BS, MA, MA, PhD, University of Kansas, Certified Psychologist.

MADDEN, HENRY M. (1949), College Librarian
BA, Stanford University; BLS, University of California; MA, PhD, Columbia University.

MANNING, JOHN CHORLTON (1960), Assistant Professor of Education
BA, Providence College; EdM, Bridgewater State College; EdD, Boston University.

MARDEN, PHILIP W. (1963), Assistant Professor of Sociology
BA, Rutgers State University; MA, PhD, University of Illinois.

MARGOSIAN, ARTHUR H. (1956; 1961), Assistant Professor of Journalism; Director of Public Relations
BA, MA, Fresno State College.

MARTIN, JANE A. (1963), Instructor in Physical Education
BS, Purdue University; MA, Ball State Teachers College.

MARTIN, JOHN E. (1959), Assistant Professor of Education
BA, Central State College (Oklahoma); MEd, EdD, University of Oklahoma.

MARTIN, JOHN H. (1962), Assistant Professor of Music
BS, MA, Ohio State University; EdD, University of Arizona.

MASON, R. ELAINE (1956), Associate Professor of Physical Education; Department Chairman
BA, Fresno State College; MA, Stanford University.

MATHERS, ROBERT L. (1959), Assistant Professor of Philosophy
BA, University of California at Santa Barbara; PhD, University of California at Los Angeles.

MATTHES, MARGARET J. (1961), Assistant Professor of Nursing
BA, Fresno State College; Registered Nurse.

MATTHEW, VIRGIL L., JR. (1948), Assistant Professor of Social Science
BA, Fresno State College; MA, University of California at Los Angeles.

MAUGHELLI, MARY L. (1962), Assistant Professor of Art
BA, MA, University of California.

McCLINTIC, J. ROBERT (1954), Associate Professor of Biology
BA, San Diego State College; PhD, University of California.

McCOMAS, WAYNE L. (1953), Associate Professor of Industrial Arts
BA, Santa Barbara College; MA, Stanford University.

McCOY, RALPH W. (1946), Professor of Biology
BA, MA, PhD, Indiana University.

MEEKER, MURIEL (1950), Laboratory School Teacher
BA, San Francisco State College; MA, Fresno State College.

MEEKS, KENNETH L. (1957; 1961), Professor of Education; Campus Coordinator of Sudan Project (1961–64)
BA, Central Washington College of Education; BEd, College of Puget Sound; MA, EdD, Stanford University.

MILLER, CARL E. (1961), Assistant Professor of Education (Sudan Project 1963–64)
BS, Anderson College (Indiana); MA, Eastern New Mexico University; EdD, Texas Technological College.

MILLER, HARRY E. (1960), Associate Professor of Physical Education
BA, Eastern New Mexico University; MA, Colorado Western College.

MILLER, MARTHA J. (1962), Activities Adviser
BA, Baylor University; MRE, Carver School of Missions and Social Work (Kentucky).

MILLER, WILLIAM M. (1956), Assistant Professor of Chemistry
BS, University of Illinois; MS, PhD, State University of Iowa.

MINICK, ROBERT A., JR. (1962), Assistant Professor of Economics
BS, MS, North Texas State College.

MINSCHEW, WILLIAM E., JR. (Spring 1963), Assistant Professor of Art
BS, Atlantic Christian College; MFA, University of North Carolina.

MONTS, ELIZABETH A. (1955), Assistant Professor of Home Economics and Education
BS, Eastern State College (Illinois); MS, University of Wisconsin; PhD, Texas Woman's University.

MOROZ, MYRON J. (1963), Assistant Professor of Psychology
BA, University of California; MA, University of Oregon.

MUDGE, LOUIS A. (1939), Professor of Marketing
BS, MS, EdD, University of Southern California.

MULLENNIX, Grady L. (1958), Professor of Business Administration
BS, MS, North Texas State College; PhD, University of Texas.

MURPHY, JOSEPH B. (1949), Professor of Education (On sabbatical leave spring)
BS, Brigham Young University; MS, University of Utah; EdD, Stanford University.

MUSSELMAN, DARWIN B. (1953), Associate Professor of Art
BA, Fresno State College; MFA, California College of Arts and Crafts; MA, University of California.

NAGY, ELEMER J. (1960; 1962), Assistant Professor of Foreign Languages
MA, PhD, P.Pazmany University (Budapest).

NALBANDIAN, LOUISE (1963), Assistant Professor of History
BA, San Francisco State College; MA, PhD, Stanford University.

NELSEN, CLAIR E. (1950; 1955), Professor of Economics and History
BA, Fresno State College; MA, PhD, Stanford University.

NELSON, DON D. (Spring 1694), Junior Vocational Instructor in Agriculture
BS, Fresno State College; MS, University of California at Davis.

NEWCOMB, RICHARD F. (Spring 1956), Assistant Professor of Industrial Arts
BA, MA, Fresno State College.

NEWSOME, RATANA S. (1961), Assistant Professor of Home Economics
BA, Chulalongkorn University (Thailand); MS, PhD, Florida State University.

NISHIO, KAREN H. (1959; 1963), Assistant Professor of Nursing
BS, University of Dayton; MS, University of California at Los Angeles; Registered Nurse.

NIXON, ARNE J. (1961), Associate Professor of Education; Coordinator of Extension
BS, Ellendale State Teachers College (North Dakota); EdD, Western Washington College of Education; EdP, Teachers College, Columbia University

NOAKES, GEOFFREY B. (Spring 1947), Professor of Industrial Arts
BA, MA, Fresno State College.

NORTON, RICHARD (1963), Junior Vocational Instructor in Agriculture
BA, Fresno State College.

OLLIKKALA, GEORGE H. (1950), Librarian II
BA, BLS, University of California.

O'NEIL, ROBERT M. (1957), Assistant Professor of English
BA, MA, Montana State University.

PACE, R. WAYNE (1962), Assistant Professor of Speech
BS, University of Utah; MS, Brigham Young University; PhD, Purdue University.

PAGE, ROBERT C. (1961), Librarian II
BA, University of Maine; MLS, University of Washington.

PAPE, LAURENCE A. (1951), Professor of Physical Education
BA, MA, Ohio State University; EdD, Columbia University.

PARKER, LILLIE A. (1951), Librarian III
BA, BLS, University of California.

PARKER, WILLIAM M. (1950), Associate Professor of Accounting
BS, MBA, University of California; PhD, University of Southern California; Certified Public Accountant.

PELLA, CARMEN (1963), Assistant Professor of Foreign Languages
MA, University of Michigan; Dr.Ped., University de la Habana.

PERRY, JOHN V. B. (Fall 1963), Instructor in History
BS, Northern State Teachers College (South Dakota); MA, University of California.

PETRUCCI, VINCENT E. (1948), Principal Vocational Instructor in Agriculture
BS, MS, University of California (Davis).

PFLUEGER, CLAYTON C. (1959), Intermediate Vocational Instructor in Agriculture
BS, South Dakota State College; MS, State College of Washington.

PICKFORD, PATRICIA R. (Spring 1957), Assistant Professor of Social Work
BA, Fresno State College; MSW, University of California at Los Angeles.

PIEPER, W. ALAN (1963), Instructor in Psychology
BA, MA, Fresno State College; PhD, University of Missouri

PIERSOL, ROBERT J. (1961), Assistant Professor of Business Administration
BS, University of Illinois; MBA, Stanford University.

PIERSON, ALVIN P. (1941), Professor of Business Administration
BA, University of Nevada; MA, University of Florida; EdD, Stanford University.

PITT, JACK A. (1957), Assistant Professor of Philosophy; Department Chairman
BS, Sir George Williams College (Canada); BA, MA, McGill University (Canada); PhD, Yale University.

POLLOCK, WILLIAM G. (1960), Admissions Officer
BA, MA, Colorado State College.

PORCH, LOUISE W. (1942), Professor of Home Economics; Department Chairman
BS, Rockford College; MA, Columbia University; EdD, Stanford University.

POSS, STANLEY H. (1956), Assistant Professor of English
BA, University of Redlands; MA, Claremont Graduate School; PhD, University of Washington.

POWELL, FRANK V. (1955), Associate Professor of Psychology
BA, University of Redlands; MS, PhD, University of Wisconsin; Certified Psychologist.

POYTHRESS, RANSOM H. (Spring 1962), Assistant Professor of Foreign Languages
BA, Stanford University.

PROVOST, DAVID H. (1958), Assistant Professor of Political Science
BA, Pomona College; PhD, University of Queensland (Australia).

QUIBELL, EDITH M. (1947), Librarian II
BA, Pomona College.

RANDALL, CHARLES H. (1962), Assistant Professor of Speech
BA, Central Washington College of Education; MFA, Yale University.

RANDOLPH, HELEN L. (1963), Assistant Professor of Elementary Education
BA, MEd, University of Portland.

REA, RALPH C. (1954), Professor of Music; Head, Fine Arts Division; Chairman, Music Department
BM, Eastman School of Music; MA, PhD, State University of Iowa.

REA, THELMA M. (1958), Assistant Professor of Education
BS, MS, University of Idaho; EdD, Stanford University.

REES, BRYANT E. (1947), Professor of Biology
BA, MA, University of Utah; PhD, Stanford University.

REHART, B. SCHYLER, JR. (Spring 1963), Instructor in Journalism
BA, Fresno State College.

REIGHARD, EDWARD (Spring, 1960), Assistant Professor of Business Administration
BA, Middlebury College (Vermont); BD, Yale University; MBA, PhD, Stanford University.

RICH, WALLACE N. (1963), Assistant Professor of Social Work
BA, Fresno State College; MSW, Florida State College.

RICHARDS, HERBERT D. (1955), Assistant Professor of Engineering
BS, University of California; MS, Stanford University; Registered Civil and Structural Engineer.

RIPPEY, ANDREW D. (1946), Professor of Education
BS, MA, University of Florida; PhD, Ohio State University.

ROBBINS, EDWARD S. (1957), Assistant Professor of Mathematics
BA, MA, Wichita University.

ROBINSON, ETHEL A. (1946; 1950), Assistant Professor of Mathematics
BA, MA, Stanford University.

ROCKWELL, JAMES H. (1957), Assistant Professor of Industrial Arts
BS, Stout Institute; MS, Bradley University.

ROHRER, HELEN F. (1933), Professor of Business Education
BA, MA, Stanford University.

ROHRER, MARTHA D. (1958), Assistant Professor of Home Economics
BA, San Jose State College.

ROJAS, CARLOS A. (1928), Professor of Foreign Languages; Department Chairman (On leave; CSC Overseas Program 1963-64)
BA, MA, Pomona College; PhD, University of Washington.

ROSE, CARLENE (1951), Associate Professor of Home Economics (On sabbatical leave spring)
BS, University of Minnesota; MS, Oregon State College.

ROTH, LESTER J. (1956), Associate Professor of Social Science and Education
BS, Kent State University; MA, Western Reserve University; EdD, Stanford University.

ROUSEK, EDWIN J. (1948), Principal Vocational Instructor in Agriculture
BS, University of Nebraska; MS, Cornell University.

RUSSELL, KENNETH H. (1963), Assistant Professor of Chemistry
BS, Portland State College; PhD, University of Washington.

RYBICKI, C. JOY (Spring 1964), Assistant Professor of Home Economics
BA, San Francisco State College; MA, San Jose State College.

SAMPLE, EMILY C. (1934), Associate Professor of Physical Education
BS, MS, University of Southern California.

SAVILLE, ANTHONY (1961), Assistant Professor of Education
BS, Illinois State Normal University; MEd, EdD, University of Missouri.

SCARBORO, LOIS M. (1961), Librarian II
BA, University of California.

SCHEYER, BARBARA J. (1963), Assistant Professor of Nursing
BSN, University of Michigan; MA, Teachers College, Columbia University; Registered Nurse.

SCHORLING, HORACE O. (1941), Professor of Industrial Arts; Head, Applied Arts Division; Chairman, Industrial Arts Department
BA, San Jose State College; MS, EdD, Oregon State College.

SCHROETER, FRANK E. (1949), Associate Professor of Industrial Arts
BS, MS, Stout Institute.

SCHWARTZ, MARVYN S. (1958), Director of Health Services
BA, Fresno State College; MD, University of California.

SCOTT, FREDERIC A. (1957), Professor of Physics; Head, Physical Science Division; Chairman, Physics Department
BS, New York State College; MS, Lehigh University; PhD, Rice University.

SELKIRK, ROBERT J., JR. (1948), Principal Vocational Instructor in Agriculture
BS, MEd, University of California (Davis).

SHACKLETT, ROBERT L. (1949; 1955), Associate Professor of Physics
BA, Fresno State College; PhD, California Institute of Technology.

SHEEHAN, PAUL V. (1930), Professor of Journalism; Department Chairman
BA, MA, University of Washington; PhD, University of Southern California.

SHENFELD, NATHAN (1958), Assistant Professor of Psychology
BS, Illinois Institute of Technology; PhD, University of Buffalo; Certified Psychologist.

SHEPARD, BERNARD A. (1948), Professor of Journalism
BA, Union College; BS, Columbia University; MS, PhD., Syracuse University.

SHOCKLEY, JAMES T. (1951; 1956), Associate Professor of Physics
BA, MA, Fresno State College; PhD, University of Southern California.

SIBLEY, FRANCIS M. (1963), Assistant Professor of English
BA, North Georgia College; BA, Auburn University; MA, Louisiana State University.

SILVANI, HAROLD (1962), Laboratory School Teacher
BA, Fresno State College.

SLOAN, FORREST E. (1954), Associate Professor of Elementary Education
BS, Illinois State Normal University; MA, EdD, Colorado State College.

SMALLEY, R. GAYLE (1963), Instructor in Art
BFA, Rochester Institute of Technology.

SMITH, ALDEN W. (1963), Assistant Professor of Secondary Education
BA, MA, University of California; MA, PhD, Teachers College, Columbia University.

SMITH, CHARLENE K. (1960), Assistant Professor of Education
BA, Western College (Ohio); MS, Butler University; EdD, Colorado State College.

SMITH, DOROTHY E. (1940), Associate Professor of English
BS, Ohio State University; MA, University of Southern California.

SMITH, JAMES H. (1955), Professor of Engineering
EE, MS, University of Cincinnati; BA, BS, PhD, University of Illinois; Registered Electrical Engineer.

SMITH, JAMES M. (1959), Assistant Professor of Philosophy
BA, University of Southern California; MA, PhD, Brown University.

SMITH, PHILIP N. (1958), Associate Professor of Biology
BA, PhD, University of California.

SNOVER, ROBERT L., Major, USAF (1962), Assistant Professor of Air Science
BA, University of the Philippines.

SOLLIE, ALICE J. (Spring 1959), Assistant Professor of Home Economics
BS, MS, Oregon State College.

SPANGLER, RICHARD C. (Spring 1963), Lecturer in Economics; Acting Department Chairman
BA, MA, PhD, University of California at Los Angeles.

SPARKS, RICHARD K. (1961), Professor of Education; Division Head; Director of Teacher Education
BA, University of Washington; BA (Ed), Central Washington College of Education; MA, EdD, University of California.

SPENCER, EDWARD M. (1950), Dean of Educational Services and Summer Sessions
BS, Iowa State College; MA, PhD, State University of Iowa.

STAEBLER, ARTHUR E. (1955), Associate Professor of Biology
BS, MS, PhD, University of Michigan.

STANDING, KEITH M. (1958), Assistant Professor of Biology
BS, MS, Brigham Young University; PhD, Washington State University.

STANLEY, GEORGE M. (1948), Professor of Geology; Department Chairman
BS, MA, PhD, University of Michigan.

STIERWALT, RALPH E. (1957; 1962), Librarian III
BA, Fresno State College; MLS, University of California.

STRONG, WINSTON C. (1940), Principal Vocational Instructor in Agriculture
BA, Stanford University; MA, EdD, University of California.

STULL, S. LOUISE (1959), Librarian II
BA, MA, University of Illinois.

SVENSON, KARL A. (1954), Associate Professor of Political Science
BA, University of Wyoming; MA, Indiana University; PhD, State University of Iowa.

TANIGUCHI, IZUMI (1963), Assistant Professor of Economics
BBA, MBA, University of Houston.

TAYLOR, CHARLES (1938), Professor of Speech
BA, Fresno State College; MA, PhD, University of Southern California.

TENNEY, EDWARD V. (1927), Professor of Psychology; Department Chairman
BA, BS, University of California; MA, Pacific School of Religion; PhD, University of California; Certified Psychologist.

THOMAS, HOBEN (1963), Assistant Professor of Psychology
BA, University of California at Santa Barbara; MA, Pepperdine College; PhD., Claremont Graduate School.

THOMPSON, SHIRLEY M. (1953), Assistant Professor of Physical Education
BS, MS, University of Wisconsin.

TIDYMAN, CLAYTON R. (1957), Professor of Accounting
BS, MBA, PhD, University of Southern California; Certified Public Accountant.

TITUS, CHARLES B., JR. (1963), Assistant Professor of Accounting
BS, MA, University of Oklahoma.

TOCCHIO, OCTAVIO J. (1959), Associate Professor of Criminology
BA, Suffolk University; MA, American University.

TUELLER, DALLAS A. (1946), Dean of the College
BA, San Jose State College; PhD, Stanford University.

UPHOLD, WILLIAM B., JR. (1954), Associate Professor of English and Philosophy
BA, ThB, Taylor University; BD, Drew University; PhD, University of Southern California.

UTTERBACK, ROBERT T. (1956), Librarian IV
BA, William Penn College; MLS, University of California.

VAN ELSWYK, MARINUS, JR. (1957) Intermediate Vocational Instructor in Agriculture
BS, Fresno State College; MEd, University of California (Davis).

VAN GALDER, ROBERT B. (Spring 1963), Instructor in Physical Education
BA, Fresno State College.

VAN SCOYOC, MARTHELLEN R. (Fall 1963), Assistant Professor of Home Economics
BS, Purdue University; MS, Iowa State University; PhD, Ohio State University.

VAN ZWALENBERG, GEORGE (1963), Assistant Professor of Mathematics
BS, Calvin College (Michigan); MA, University of Florida.

VAVOULIS, ALEXANDER (1963), Assistant Professor of Chemistry
BA, MA, Brooklyn College; EdD, University of the Pacific.

VERDUGO, WILLIAM R. (1951), Intermediate Vocational Instructor in Agriculture (On leave, spring)
BS, California State Polytechnic College.

WAIBEL, GRACE T. (1963), Librarian II
BA, College of St. Catherine (Minnesota); MA, George Washington University; MA, University of Minnesota.

WALKER, PHILLIP N. (1950), Associate Professor of Speech
BA, MA, University of Washington

WALTON, WENDEL K. (1963), Assistant Professor of Speech
BA, MA, San Francisco State College.

WALTS, PATRICIA A. (Spring 1963), Instructor in Physical Education
BA, San Francisco State College.

WANG, CHENG (1950), Professor of Social Science (On sabbatical leave)
BA, MA, PhD, Stanford University.

WARDLE, ORRIN D. (1957), Executive Dean
BS, MS, Utah State College; EdD, University of California.

WARMERDAM, CORNELIUS A. (1947), Professor of Physical Education
BA, Fresno State College; MA, Stanford University.

WATKINS, EUGENE C. Major, USAF (1963), Professor of Air Science, Division Head
BA, University of Colorado

WATTS, PHYLLIS W. (1945), Dean of Graduate Studies
BA, Santa Barbara State College; MA, Claremont Colleges; EdD, Stanford University.

WAYNE, WILLIAM C. (1954), Associate Professor of Business Education
BS, MA, Ball State Teachers College; MS, Indiana University; EdD, University of Southern California.

WEBSTER, NORMAN D. (1962), Librarian II
BA, University of Michigan; MLS, University of California.

WEILER, JOHN H., JR. (1962), Assistant Professor of Botany
BS, University of Nebraska; PhD, University of California.

WELCH, MARIE R. (1961), Assistant Professor of Nursing
BS, Simmons College (Massachusetts); MA, University of Michigan; Registered Nurse.

WEST, VIRGINIA C. (1941), Librarian IV
BA, University of California; BS, MS, University of Southern California.

WHALEN, MARY M. (1961), Laboratory School Teacher
BA, St. Mary College (Kansas).

WHEATON, HERBERT H. (1922), Dean of Arts and Sciences; Head, Letters and Science Division (On sabbatical leave spring)
BS, University of Wisconsin; MS, CE, University of California; Registered Civil Engineer.

WHEELER, CHARLES L., JR. (1959), Housing Coordinator
BA, Pasadena College; BD, Nazarene Theological Seminary; MA, Fresno State College.

WIGHT, WILMA F. (1940), Associate Professor of Office Administration
BA, MA, Stanford University.

WILCOX, ORLEY W. (1959), Associate Professor of Education; Chairman, School Administration Department
BA, Southwestern College (Kansas); MS, Kansas State Teachers College; EdD, University of Colorado.

WILD, ERNEST S. (1948), Associate Professor of Physical Education
BS, MS, Kansas State College.

WILEY, FRANCIS A. (1946), Professor of History; Department Chairman
BA, Emory and Henry College; MA, Duke University; PhD, University of California.

WILLIAMS, F. SUNSHINE (1957), Assistant Professor of Art and Education
BA, MA, Stanford University.

WILLIAMS, WESLEY M. (1961), Assistant Professor of Art
BA, MA, University of California; EdD, Stanford University.

WILSON, DONALD M. (1956), Associate Professor of Speech
BA, Western Washington College of Education; MA, PhD, University of Southern California.

WILSON, GORDON (1947), Associate Dean of Students (Activities—Housing)
BA, Fresno State College; MS, University of Southern California.

WINTER, EGON P. (1963), Assistant Professor of Economics
BS, Iowa State College; MS, Colorado State College; PhD, University of Wisconsin.

WINTER, JAMES H. (1947), Professor of Music
BA, Carleton College; MMus, Northwestern University; PhD, State University of Iowa.

WITHROW, MIRIAM F. (1931), Professor of Music
PhB, University of Chicago; MA, University of Iowa.

WOMACK, ENNIS B. (1947), Professor of Chemistry
BA, MA, Union University; PhD, University of Chicago.

WOMACK, J PRINTISE (1958), Librarian II
BA, San Francisco State College; MLS, University of California.

WOOD, RAYMUND F. (1950), Librarian III (On sabbatical leave spring)
BA, St. Mary's University; MA, Gonzaga University; MSLS, University of Southern California; PhD, University of California at Los Angeles.

WOODWICK, KEITH H. (1955), Associate Professor of Biology
BS, Jamestown College; MS, University of Washington; PhD, University of Southern California.

WRIGHT, EVELYN H. (1948), Counselor
BA, Cedar Crest College; MA, Syracuse University.

WRIGHT, FREEMAN J. (1963), Assistant Professor of Political Science
BS, MS, Montana State College; PhD, Johns Hopkins University.

WRIGHT, JOHN W. (1929), Professor of Speech; Head, Speech Arts Division
BA, MA, University of Washington; EdD, University of California.

ZANE, BURKE (1962), Assistant Professor of Mathematics
BA, Fresno State College; MA, PhD, University of Oregon.

ZUMWALT, EUGENE E. (1959), Assistant Professor of English
BA, MA, University of Oregon; PhD, University of California.

PART-TIME FACULTY, 1963-64

ANDERS, JOHN ROBERT, Assistant Professor of Home Economics
BA, MSW, Louisiana State University.

ANDERS, MARY J., Instructor in Speech
BA, MA, George Peabody College for Teachers.

ARNOLD, ROBERT F., Assistant in Mathematics
BS, Fresno State College.

BARNETT, EDWARD L., Assistant in Mathematics
BA, University of California.

BLAKE, JAMES A., Assistant in Biology
BA, Fresno State College.

BOZARTH, ROBERT G., Assistant Professor of Accounting
BA, Fresno State College; Certified Public Accountant.

CHENG, MOON-PING, Assistant in Chemistry
BS, National Taiwan University (China).

CLARK, CHARLES W., Assistant Professor of Education
BA, MA, Fresno State College.

CLEGG, REED K., Assistant Professor of Criminology
BS, MS, University of Utah; LLB, American Extension School of Law.

CROSSMAN, KEITH V., Assistant in Biology
BS, Fresno State College.

ENMARK, M. NELSON, Assistant Professor of Business Administration
BA, LLB, University of California.

GRAVES, GORDON R., Instructor in Psychology and Education
BA, MA, Fresno State College.

GRAVES, VERNE C., Assistant Professor of Business Administration
BS, Arizona State University.

GUZMAN, PAULA S., Instructor in Physical Education-Recreation
BA, Fresno State College.

HAHESY, JEFFERSON E., Assistant Professor of Philosophy
BA, Fresno State College; LLB, Harvard Law School.

HAM, CECELIA, Assistant Professor of Elementary Education
BA, Fresno State College.

HARRIS, WILLIAM M., Assistant in Biology
BA, Fresno State College.

HENRY, FRANCES L., Instructor in Art
BA, Sam Houston State College (Texas).

HILL, GEORGINA F., Assistant in English
BA, Occidental College.

INGRAM, MARIA, Assistant Professor of Speech
BA, Pennsylvania State University; MA, Fresno State College.

ISAAK, DANIEL, Assistant Professor of Biology
BA, Tabor College (Kansas); MA, PhD, University of Minnesota.

JACOBS, MICHAEL G., Assistant in Mathematics
BA, Fresno State College.

JOHNSTON, KATHRYN M., Assistant Professor of Home Economics
BS, Dakota Wesleyan University.

KASAI, AMY E., Instructor in Art
BA, University of Minnesota.

KELLAS, ESTHER V., Instructor in English
BA, MS, Fresno State College.

KLASSEN, PETER J., Assistant Professor of History
BA, University of British Columbia; MA, PhD, University of Southern California.

KOLIGIAN, ALICE L., Instructor in Chemistry
BA, Fresno State College.

KOONTZ, S. KERMIT, Assistant Professor of Health Education
BA, Fresno State College; MA, Stanford University.

KOSTIW, DIMITRI G., Instructor in Music
BA, Occidental College.

LARSEN, LELAND M., Lecturer in Animal Science
BS, Fresno State College; MS, PhD, Oregon State University.

LAWSON, JACK O., Assistant in Foreign Languages.

LeCOUNT, ADNA M., Assistant Professor of Education
BS, University of California; MA, EdD, Teachers College, Columbia University.

LEIH, THOMAS J., Assistant in Mathematics
BA, Fresno State College.

LEW, ROBERT W., Assistant in Physics
BS, University of California.

LIVINGSTON, WINIFRED M., Instructor in Office Administration
BA, Fresno State College.

McDERMOTT, WILLIAM J., Assistant Professor of Business Administration
BA, Fresno State College; LLB, University of California.

McHENRY, JAMES A., Assistant in Biology
BA, Fresno State College.

McKEIGHAN, GEORGIA L., Assistant in Foreign Languages
BA, University of California.

MARTINEZ, ERNEST A., Assistant in Foreign Languages
BA, Fresno State College.

MITCHELL, JAMES H., Assistant in Chemistry
BA, Fresno State College.

MORTLAND, WILLIAM J. JR., Assistant Professor of Criminology
BA, Fresno State College.

NAKUGUCHI, GLENN M., Assistant in Chemistry
BS, Fresno State College.

NICKEL, THEODORE R., Assistant Professor of Foreign Languages
BA, University of California at Los Angeles;
MA, University of Southern California.

ODORFER, ADOLF, Associate Professor of Art
BA, Fresno State College.

PEART, GILBERT, Assistant Professor of Marketing
BA, Ball State Teachers College; MA, Columbia University;
EdD, Indiana University.

PEIRSOL, MADGE, Physician
BA, Pomona College; MD, Stanford University.

POTTER, GARY W., Assistant in Biology
BA, Fresno State College.

POTTER, ROBERT W., Physician
BA, Stanford University; MD, New York University.

SACKS, JOSEPH M., Assistant Professor of Home Economics
BS, New York University; MA, University of Pennsylvania; PhD, New York University.

SAWYERS, W. HAMPTON, Assistant Professor of History
BA, Fresno State College; MA, University of California.

SCHROER, DALE F., Assistant Professor of Education
BS, University of Cincinnati; MA, Columbia University.

SCHROLL, JOANNE W., Instructor in Physical Education
BA, Fresno State College.

SCOTT, HERBERT S., Instructor in English
BA, Fresno State College.

SHAHBAZIAN, THERESA, Instructor in Nursing
BA, Fresno State College; Registered Nurse.

SIMPSON, ELIZABETH S., Instructor in English
BA, Fresno State College.

SINGH, AJMEL, Assistant in Biology
BA, Fresno State College.

SMITH, WILLIAM E., Principal Vocational Instructor in Agriculture
DVM, Kansas State College.

SNYDER, HOWARD G., Assistant Professor of Education
BA, Dartmouth College; MA, University of Minnesota.

STEGGAL, CLAIR T., Physician
BA, University of California at Los Angeles; MD, University of Southern California.

TAYLOR, FRANK E. JR., Assistant Professor of Accounting
BS, MBA, University of California at Los Angeles.

THOREN, MARY E., Instructor in Home Economics
BA, Whittier College.

TILGHMAN, CHARLES S., Instructor in English
BA, Catholic University of America; MA, Fresno State College.

TOFFOLI, WINONA B., Instructor in Biology
BA, University of California; MA, Fresno State College.

VERMEL, PAUL, Assistant Professor of Music
BA, French Lycee (France).

WAGER, JUNIA N., Instructor in Home Economics
BS, Michigan State University.

WALTERS, EDWARD E., Assistant in Physics
BA, Illinois Wesleyan University.

WILLEMSEN, ELEANOR W., Instructor in Psychology
BA, MA, Stanford University.

WILLIAMS, PEGGY F., Assistant in English
BA, Fresno State College.

WILLETT, J. MANSEL, Instructor in Art
BA, David Lipscomb College (Tennessee); MA, Fresno State College.

WINTER, EDNA, Physician
BA, MD, University of California.

WOOD, KENNETH A., Assistant Professor of Education
BS, University of Oregon; MA, San Jose State College.

YEARY, PATRICIA C., Instructor in Home Economics
BS, University of California at Los Angeles.

ZEIFERT, MARK, Associate Professor of Psychology; Physician
BS, St. Louis University; MS, University of Michigan; MD, St. Louis University.

ZEPEDA, JOSEFINA R., Assistant in Foreign Languages
BA, Fresno State College.

EMERITI

(Numbers in parentheses indicate years of service at Fresno State College)

THOMAS, FRANK W (1917-1948), President Emeritus
BA, Indiana University; MA, University of Illinois; PhD, Stanford University; LLD, Occidental College.

ADDINGTON, ARCH R. (1928-1960), Professor Emeritus of Geology
BA, MA, Indiana University.

ALLINGHAM, GRACE (1918-1944), Associate Professor Emeritus of Home making
BS, Kansas State Agricultural College; BS, MA, Columbia University.

BAKER, MARY C. (1927-1948), Dean of Women Emeritus
BA, Stanford University.

BAKER, RANNIE B. (1942-1956), Professor Emeritus of English
BS, Northwestern University; MA, Rollins College; PhD, Syracuse University.

BELL, ALICE K. (1925-1957), Professor Emeritus of Mathematics
BA, Ottawa University; MA, University of Michigan.

BILLARD, GERTRUDE S. (1938-1957), Professor Emeritus of English
BA, Mt. Holyoke College; MA, PhD, Cornell University.

BORLESKE, STANLEY E. (1929-1958), Associate Professor Emeritus of Engineering
BS, University of Michigan; BA, Fresno State College; MA, University of California.

BRADFORD, LILAH C. (1928-1958), Associate Professor Emeritus of Secretarial Administration
BA, University of Oregon; MA, Stanford University.

BRIGGS, MITCHELL P. (1928-1954), Dean of Instruction Emeritus
BA, Morningside College; MA, University of Wisconsin; PhD, Stanford University.

BUGGE, HILDA HENDRICKSON (1931-1956), Associate Professor Emeritus of Speech
BA, MA, University of Wisconsin.

BURBRIDGE, HARRY C. (1921-1954), Professor Emeritus of Physics
BA, PhD, Stanford University.

CANFIELD, JAMES W. (1927-1957), Associate Professor Emeritus of Education
BS, University of Utah; MA, University of California.

COLBURN, GUY B. (1922-1952), Professor Emeritus of Foreign Languages
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