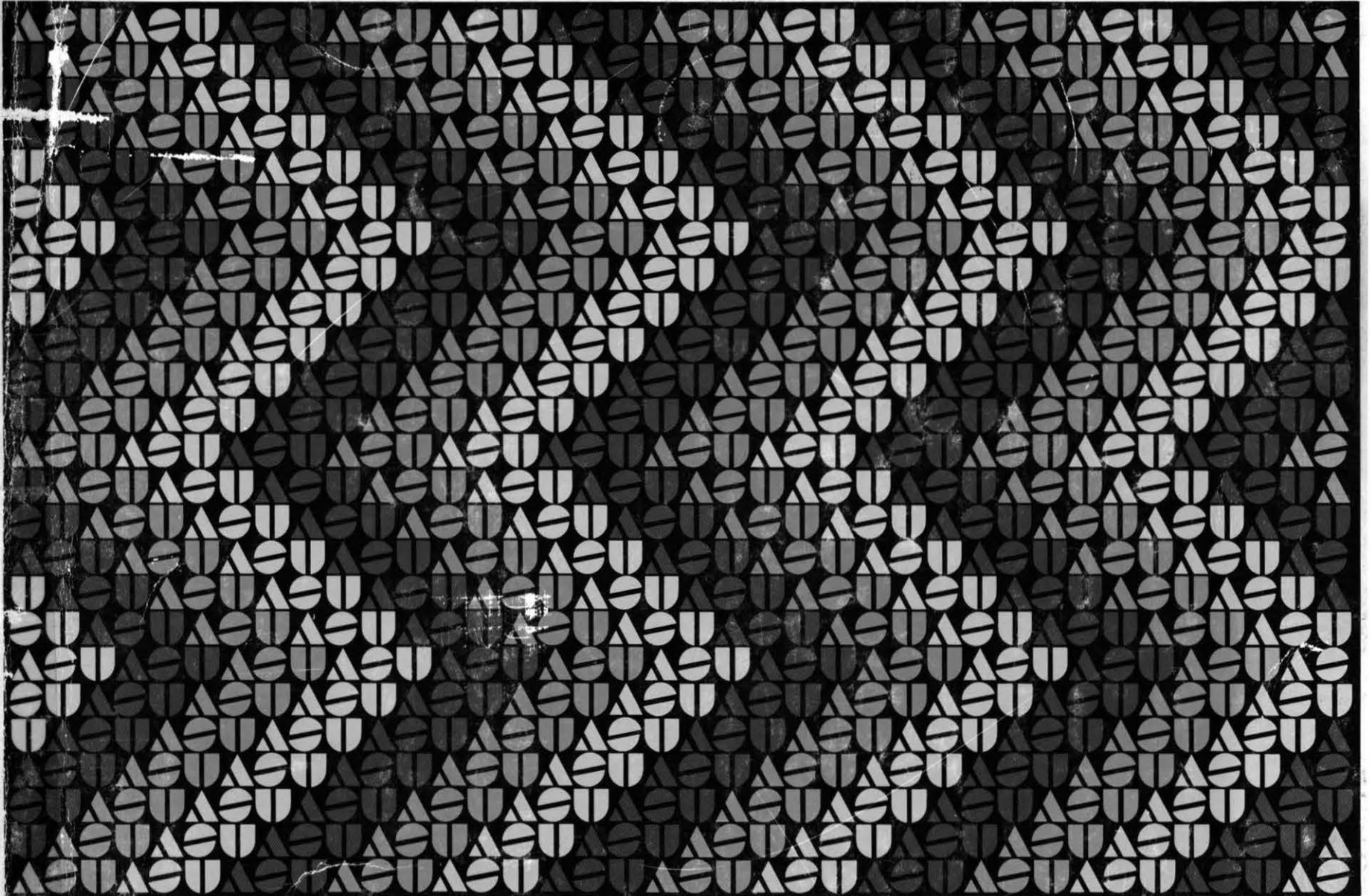


# Arizona State University General Catalog 1971-72/1972-73





# General Catalog

1971-72 / 1972-73

# ARIZONA STATE UNIVERSITY

Requests for detailed information should be addressed as follows:

REGISTRAR AND DIRECTOR OF ADMISSIONS  
ARIZONA STATE UNIVERSITY  
TEMPE, ARIZONA 85281

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Arizona State University reserves the right to change without notice any of the materials — information, requirements, regulations — published in this Bulletin.

Arizona State University is fully committed to the spirit, letter and intent of the purpose of Title VI of the Civil Rights Act of 1964. Qualified students are welcome at the University without regard to race, creed, color, or national origin.

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Mall Fountain

# Colleges, Schools, Divisions, and Departments of Instruction

## COLLEGE OF LIBERAL ARTS

DEPARTMENTS: Aerospace Studies, Anthropology, Botany and Microbiology, Chemistry, English, Foreign Languages, Geography, Geology, Health, Physical Education and Recreation, History, Home Economics, Mass Communications, Mathematics, Military Science, Philosophy, Physics, Political Science, Psychology, Sociology, Zoology.

## COLLEGE OF ARCHITECTURE

## COLLEGE OF BUSINESS ADMINISTRATION

DEPARTMENTS: Accounting, Administrative Services, Economics, General Business Administration, Management, Marketing, Quantitative Systems.

## COLLEGE OF EDUCATION

DEPARTMENTS: Elementary Education, Secondary Education, Educational Administration and Supervision, Educational Foundations, Counselor Education, Educational Psychology, Special Education, Educational Technology and Library Science.

## COLLEGE OF ENGINEERING SCIENCES

**School of Engineering.** FACULTIES: Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering Mechanics and Materials, Engineering Science, Industrial Engineering, Mechanical Engineering.

**Division of Agriculture.** Agricultural and Resources Economics, Ag-Industry, Bio-Agricultural Sciences, Environmental Resources in Agriculture.

**Division of Construction.**

**Division of Technology.** Aeronautical Technology, Electronic Technology, Graphic Communications, Industrial Design, Industrial Technology Education, Manufacturing Engineering Technology, Mechanical Engineering Technology Core, Technical Education Technology.

## COLLEGE OF FINE ARTS

DEPARTMENTS: Art, Music, Speech and Theatre, Center for Humanities

## COLLEGE OF LAW

## COLLEGE OF NURSING

## GRADUATE COLLEGE

## GRADUATE SCHOOL OF SOCIAL SERVICE ADMINISTRATION

## UNIVERSITY EXTENSION AND SUMMER SESSIONS

# University Calendar

## 1971 / 1972 / 1973

Fall Semester	1971-72	1972-73
Final Date for Receipt of Undergraduate Admission or Readmission Credentials	Aug 14, Sa	Aug 14, M
First Faculty Meeting	Sept 2, Th	Sept 1, F
First Freshman Assembly	Sept 7, Tu	Sept 8, Tu Aug 22, Tu
Orientation and Advisement for New Students	Sept 7-9 Tu-Th	Sept 5-7 Aug 22-24 Tu-Th
All Students Complete Registration and Pay fees	Sept 9-10 Th-F	Sept 7-8 Aug 24-25 Th-F
Instruction Begins	Sept 13, M	Sept 11, M Aug 28, M
Last Day of Late Registration	Sept 17, F	Sept 15, F Sept 1, F
Last Day Courses May Be Dropped Without Penalty	Oct 22, F	Oct 20, F
Veterans Day, No Classes	Oct. 25, M	Oct 23, M
Mid-Semester Scholarship Reports Due	Nov. 5, F	Nov 3, F
Candidates for Bachelor's Degree Must File Application for Graduation by	Nov 12, F	Nov 10, F
Thanksgiving Recess, Classes Excused	Nov 25, Th through Nov 28, Su	Nov 23, Th through Nov 26, Su
Christmas Vacation	Dec 18, Sa through Jan 2, Su	Dec. 16, Sa through Jan 2, Tu
Instruction Ends	Jan 15, Sa	Jan 13, Sa
Final Examinations	Jan 17-21 M-F	Jan 15-19 M-F

For the calendar of the College of Law, see the *Bulletin* of that College.

UNIVERSITY CALENDAR

Spring Semester	1971-72	1972-73
Final Date for Receipt of Undergraduate Admission or Readmission Credentials	Dec 22, W	Dec 22, F
Advisement, New and Continuing Students	Jan 31, M	Jan 29, M
All Students Complete Registration and Pay Fees	Feb 1-2 Tu-W	Jan 30-31 Tu-W
Instruction Begins	Feb 3, Th	Feb 1, Th
Last Day of Late Registration	Feb 9, W	Feb 7, W
Last Day Courses May Be Dropped Without Penalty	Mar 15, W	Mar 14, W
Washington's Birthday, No Classes	Feb 21, M	Feb 19, M
Charter Day Convocation	Mar 13, M	Mar 12, M
Mid-Semester Scholarship Reports Due	Mar 31, F	Mar 30, F
Spring Recess, Classes Excused	Apr 1, Sa through Apr 9, Su	Mar 31, Sa through Apr 8, Su
Instruction Ends	May 26, F	May 25, F
Final Examinations	May 30, 31 June 1, 2, 3, Tu, W, Th, F, Sa	May 29, 30, 31, June 1, 2, Tu, W, Th, F, Sa
Commencement Exercises	June 2, F	June 1, F
Summer Sessions	1971-72	1972-73
First Summer Session Registration	June 10, Sa	June 9, Sa
Instruction Begins	June 12, M	June 11, M
First Summer Session Ends	July 14, Fr	July 13, Fr
Second Summer Session Registration	July 15, Sa	July 14, Sa
Instruction Begins	July 17, M	July 16, M
Second Summer Session Ends	Aug 18, Fr	Aug 17, Fr

1971

JULY							AUGUST							SEPTEMBER						
SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT
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4	5	6	7	8	9	10	8	9	10	11	12	13	14	5	6	7	8	9	10	11
11	12	13	14	15	16	17	15	16	17	18	19	20	21	12	13	14	15	16	17	18
18	19	20	21	22	23	24	22	23	24	25	26	27	28	19	20	21	22	23	24	25
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1972

OCTOBER							NOVEMBER							DECEMBER							
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31																					

JANUARY							FEBRUARY							MARCH						
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APRIL							MAY							JUNE							
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1973

JULY							AUGUST							SEPTEMBER						
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JANUARY							FEBRUARY							MARCH						
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7	8	9	10	11	12	13	11	12	13	14	15	16	17	11	12	13	14	15	16	17
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APRIL							MAY							JUNE						
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29	30																			

# Organization, History, General Information

## Objectives

Arizona State University educates for leadership and responsible citizenship. Increased competence, improved moral and ethical standards, expanded cultural horizons, and enhanced ability to seek answers to fundamental questions of human concern are the objectives of the University.

## Organization

Established in 1885 as the Arizona Territorial Normal School, Arizona State University is one of three major institutions governed by the Arizona Board of Regents, a body corporate and politic with perpetual succession under the Constitution and laws of Arizona. The Board consists of eight citizens appointed by the Governor of the State for terms of eight years, with the elected Governor and State Superintendent of Public Instruction as members ex officio. The Regents govern the University of Arizona (Tucson), Northern Arizona University (Flagstaff), and Arizona State University.

The Regents select and appoint the President of the University, who is the chief executive officer and the regular means of communication between the Board of Regents and the institution. The President is aided in the administrative work of the institution by Vice Presidents, Deans, Faculties, Directors, Departmental Chairmen and other officers.

The faculties and students of the University play an important role in educational policy, with a Faculty Senate, joint University councils, and the organs of the Associated Students serving the needs of a large institution. A comprehensive system of joint faculty, student, alumni and staff committees

provides a constant exchange of ideas and collaboration on the part of all members of the University.

Arizona State University is organized into the Colleges of Liberal Arts, Architecture, Business Administration, Education, Engineering Sciences, Fine Arts, Law and Nursing; the Divisions of Agriculture, Technology and Construction; a Graduate School of Social Service Administration; Summer Sessions and University Extension; a Graduate College, and 52 departments of instruction. These academic agencies develop and effectuate the major teaching, research and service programs of the University, aided by the University libraries, museums, centers and other services.

## History of Arizona State University

On February 26, 1885, House Bill 164, An Act to Establish a Normal School in the Territory of Arizona, was introduced in the Thirteenth Legislative Assembly of Arizona Territory by John Samuel Armstrong. The Bill, strongly supported by Charles Trumbull Hayden of Tempe, passed the House on March 6, the Council on March 11, and was signed by Governor F. A. Tritle on March 12, 1885. Thus came into existence the institution today known as Arizona State University. Instruction was instituted on February 8, 1886, when 33 students met in a single room under the supervision of Hiram Bradford Farmer.

The institution began with the broad obligation to provide "instruction of persons . . . in the art of teaching and in all the various branches that pertain to a good common school education; also, to give instruction in the mechanical arts and in husbandry and agricultural chemistry, the

fundamental law of the United States, and in what regards the rights and duties of citizens.”

With the growth of the state, especially the surrounding Phoenix metropolitan area, the school has carried forward this charter, accompanied by successive changes in its scope, name and government. On March 9, 1945, the three state institutions of higher learning came under the authority of one Board of Regents. By vote of the people, on November 4, 1958, the name Arizona State University replaced the previous name, Arizona State College.

### Accreditation and Affiliation

Arizona State University is accredited by the North Central Association of Colleges and Secondary Schools. Professional programs in the various colleges, schools, divisions and departments are accredited by the corresponding national bodies. Arizona State University is a member of the National Association of Universities, and is affiliated with the American Council on Education and other international, national and regional associations.

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## University Campus

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### Environment

**Location.** Arizona State University is near the heart of metropolitan Phoenix in the city of Tempe. Within a few minutes' drive of the campus are the municipalities comprising the fast-growing Phoenix area — Scottsdale, Mesa, Chandler, Gilbert, Glendale, Litchfield Park, Peoria and other communities.

**Historical and Scenic Features.** Nearby are such landmarks as the Apache Trail, the man-made lakes of the Salt River Project, Roosevelt and Coolidge Dams, and the Casa Grande National Monument. Somewhat more distant are the internationally famous Grand Canyon of the Colorado, Glen Canyon Dam and Lake Powell, scenic Oak Creek Canyon, communities of the American Indian peoples, the Arizona-Sonoran deserts and other famed beauty spots.

### Grounds

**Campus.** Most of the major buildings on the 330-acre campus have been erected during the past ten years. Broad lawns and subtropical trees provide year-round greenery.

**UNIVERSITY FARM.** The 320-acre farm is located six miles southeast of the campus. It is used for experimental and practical work in various phases of agricultural science.

**CAMP TONTOZONA.** Located in the famed Mogollon Rim country near Payson, this facility of the University community serves academic departments which conduct teaching and research in mountain terrain.

### University Libraries and Collections

(Year of construction in parentheses.)

**CHARLES TRUMBULL HAYDEN LIBRARY** (1966). The University's main library houses 1,300,000 volumes in 205,000 square feet of enclosed space. The five-story structure has seating for 3,000 persons, including 1,176 study carrels and 69 faculty studies. Among special collections are the Arizona Collection, Curriculum Laboratory, the Papers of Carl Hayden, Barry Goldwater and John J. Rhodes, and the library facility of the Solar Energy Society.

**ARCHITECTURE LIBRARY.** Contains more than 10,000 books on architecture and construction, plus subscriptions to 180 periodicals and a 15,500-slide file in these fields.

**AUDIOVISUAL FILM LIBRARY.** (See Services below.)

**ARIZONA HISTORICAL FOUNDATION LIBRARY.** Under a cooperative agreement with ASU, the Foundation's library of several thousand volumes is housed in the Charles Trumbull Hayden Library.

**LAW LIBRARY.** A growing collection of some 100,200 volumes is located in the John S. Armstrong Law Building. The facility is designed to house 200,000 volumes.

**MUSIC RESEARCH FACILITY.** A major collection of music scores, books and periodicals is housed in the Music Building.

### University Buildings

**ACADEMIC SERVICES BUILDING** (1951). University Extension and Summer Sessions; Personnel Department, Career Services; Departments of Geography and Mass Communications.

**ADMINISTRATION BUILDING** (1951). University administration and business offices; the Graduate College.

**AGRICULTURE BUILDING** (1948). Division of Agriculture; Department of Geology.

**ALUMNI HOUSE** (1907) Alumni Association.

**ANTHROPOLOGY BUILDING** (1914). Department of Anthropology.

**ARCHITECTURE BUILDING** (1970). College of Architecture.

**JOHN S. ARMSTRONG LAW BUILDING** (1967). College of Law.

**ART BUILDING** (1970). Department of Art.

**BUSINESS ADMINISTRATION BUILDING** (1968 and 1970). College of Business Administration.

**CENTRAL PLANT** (1960). Central heating and cooling.

**EDUCATION COMPLEX: HIRAM BRADFORD FARMER EDUCATION BUILDING** (1961); **IRA D. PAYNE HALL** (1969); **EDUCATION LECTURE HALL** (1969). College of Education.

**ENGINEERING CENTER** (Wings A through F, 1957; Wing G, 1964). College of Engineering Sciences; School of Engineering; University Computer Center; Engineering Research Center; Division of Construction; KAET television studios.

**FOREST HYDROLOGY BUILDING** (1964). Rocky Mountain Forest and Range Experiment Station of the U. S. Forest Service.

**GRADY GAMMAGE MEMORIAL AUDITORIUM** (1964). See below.

**HOME ECONOMICS BUILDING** (1951 and 1968). Department of Home Economics. Adjacent building houses research facility for the Center of Family Life Studies.

**KRAUSE HALL** (1905). Payroll Services.

**LANGUAGE AND LITERATURE BUILDING** (1965 and 1971). Departments of English, Foreign Languages, Speech and Theatre; Speech and Hearing Clinic.

**LECTURE HALLS** (1969). **MURDOCK AND NEEB**.

**LIBERAL ARTS ANNEX** (1909). Liberal Arts faculty offices.

**LIFE SCIENCES CENTER** (1959, 1963, 1971). Departments of Botany and Microbiology, Zoology; Poisonous Animals Research Laboratory.

**LYCEUM THEATRE** (1939). University Players.

**MATTHEWS CENTER** (1930). University Art Collections; College of Fine Arts; Dean of Students; student services.

**MATTHEWS HALL** (1918). Audiovisual Services; Bureau of Publications.

**MEMORIAL UNION** (1956, 1970). University cultural, social and recreational center; University Bookstore.

**MOEUR ADMINISTRATION BUILDING** (1939). Registrar and Director of Admissions; Housing Office; Data Processing Service.

**MUSIC BUILDING** (1971). Department of Music; Music Research Facility.

**COLLEGE OF NURSING BUILDING** (1966). College of Nursing; Graduate School of Social Service Administration.

**OLD MAIN BUILDING** (1894). Departments of Aerospace Studies and Military Science; classrooms.

**PHYSICAL EDUCATION BUILDING** (1952). Sun Devil Gymnasium; Department of Health, Physical Education and Recreation.

**PHYSICAL PLANT** (1966). Planning and Construction; Department of Security; maintenance shops.

**PHYSICAL SCIENCES CENTER** (1959, 1965, 1968). Departments of Chemistry, Mathematics, Physics, Philosophy; Center for Meteorite Studies.

**QUADRANGLE** (1913, 1914, 1936). Various student services.

**SOCIAL SCIENCES BUILDING** (1960). College of Liberal Arts; Departments of History, Political Science, Psychology, Sociology; Psychological Clinic; Institute of Public Administration.

**JOE SELLEH FIELD** (1967). Track and field facility.

**STUDENT HEALTH SERVICE** (1969). Infirmary.

**SUN DEVIL FIELD** (1960). Baseball field.

**SUN DEVIL STADIUM** (1958). Football stadium.

**SWIMMING POOL** (1957).

**TECHNOLOGY COMPLEX** (1964, 1966). Division of Technology; Industrial Technology Building and Aeronautical Technology Building.

**WOMEN'S PHYSICAL EDUCATION BUILDING** (1966).

## Residence Halls

M. O. Best (1956, 1967).

Dixie Dees Gammage (1941).

Charles Trumbull Hayden (1951).

Frederick M. Irish (1940).

James H. McClintock "A" (1951), "B" (1956).

Manzanita (1967).

Mariposa (1969). Graduate student resident center.

Palo Verde East (1963).

Palo Verde Main (1958).

Palo Verde West (1964).

Sahuaro (1958).

George W. Wilson (1956).

Adelphi Housing (1954). Five units for small-group housing.

Fraternity Housing (1962). Ten units for small-group housing.

### Educational Resources and Services

**GRADY GAMMAGE MEMORIAL AUDITORIUM.** Center for the Performing Arts at Arizona State University, was designed by Frank Lloyd Wright and was named for the late President Gammage. This versatile auditorium seats 3,000 and has won wide acclaim for its design and acoustics. In addition to the great hall and related facilities (including the Aeolian-Skinner organ contributed by Hugh W. and Barbara V. Long, largest pipe organ in the state), the building contains classrooms and workshops for the College of Fine Arts.

**UNIVERSITY ART COLLECTIONS.** On display in Matthews Center, the collections include paintings in oil, watercolor and tempera, numerous works of sculpture and ceramics, and an extensive print collection. The Collection of American Art, founded by the late Oliver B. James, is permanently on display. Selections from the collections of Mr. and Mrs. Read Mullan, Mr. and Mrs. Orme Lewis, Lewis and Lenore Ruskin, Mrs. Henry Luce, and Edward Jacobson are shown periodically.

**I. D. PAYNE LABORATORY.** Situated in the College of Education, the Laboratory is engaged in educational experimentation and learning research, with especial concern for aiding and enhancing the educational progress of disadvantaged children.

**UNIVERSITY COMPUTER CENTER.** Located in the Engineering Center, this facility serves research, teaching and experimental needs.

**INSTRUCTIONAL RESOURCES LABORATORY.** Located in Payne Hall, this laboratory provides the setting for research and development in the areas of educational products. It also provides materials and equipment

services to the students and faculty of the College of Education.

**DATA PROCESSING SERVICE.** This campus bureau, in the Moeur Administration Building, is designed to serve the institutional and educational needs of the University.

**BUREAU OF BROADCASTING.** Television Facilities: The Bureau operates Arizona State University's educational television station (KAET, Channel 8). These facilities are used for training students in television skills in addition to telecasting educational programs to the general public.

Radio Facilities: The Bureau operates a professionally equipped broadcasting unit, KASN, located in the Engineering Center, to serve the teaching program in radio skills.

**AUDIOVISUAL SERVICES.** The Center includes the Educational Graphic Arts Service, the Photographic Service, and the Film Library, located in Matthews Hall. Its 8,000 films, cooperatively owned by 124 member schools, by ASU and by governmental agencies and industries which deposit films in the library, is one of the ten largest collections in the United States.

**INSTITUTE OF PUBLIC ADMINISTRATION.** With its Survey Research Center and Center for Urban Studies, the Institute combines educational activities, research studies, conferences and special programs in the broad fields of public and urban concerns.

**CENTER FOR METEORITE STUDIES:** One of the nation's largest collections of extra-terrestrial materials is available for research in the Center for Meteorite Studies, housed in the Physical Sciences Center.

I. D. Payne Hall, College of Education Complex



# Admission, Academic Standards and Graduation

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## Undergraduate Admission and Registration

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### Admission Procedures for New Freshman and Transfer Students

TO BE CONSIDERED FOR ADMISSION TO AN UNDERGRADUATE PROGRAM, ALL PROSPECTIVE STUDENTS MUST HAVE ON FILE — IN THE OFFICE OF REGISTRAR AND DIRECTOR OF ADMISSIONS — A COMPLETED APPLICATION, ALL TRANSCRIPTS, APTITUDE TEST SCORES AND MEDICAL HISTORY AND EXAMINATION FORM AS EXPLAINED BELOW, NO LATER THAN AUGUST 14 FOR FALL SEMESTER AND DECEMBER 22 FOR SPRING SEMESTER:

**Initial Inquiry.** Inquiries regarding admission must be directed to the Office of Registrar and Director of Admissions, Arizona State University, Tempe, Arizona 85281. Upon receipt of the inquiry a detailed letter of instruction, an application for admission, a medical examination form with return envelope, housing information request card and a copy of the University catalog will be provided.

**Application.** Prospective students must submit a completed application on the official application form to the Office of Registrar and Director of Admissions. All undergraduate applicants for admission residing out of the state of Arizona must pay a nonrefundable admission application fee at the time application for admission is made.

Students who have registered in other colleges and universities cannot disregard their records in such institutions in order to make application for admission solely on the basis

of their high school records. Failure to report previous college or university attendance at the time of application is considered misrepresentation and falsification of University records and is sufficient cause for cancellation of the student's enrollment, of any credits earned, or both.

**Transcripts.** Official transcripts of academic records from high school and all institutions of higher education previously attended must be mailed by the registrar's office of the issuing institutions directly to the Office of Registrar and Director of Admissions. Transcripts will not be accepted from students. High school transcripts must show grade point average, rank in class and date of graduation.

All transcripts or credentials submitted from other institutions become the property of Arizona State University. Neither the original nor copies will be released from the files. When duplicates are required, students must obtain new transcripts from the issuing institution. Admission credentials and transcripts of applicants who do not enroll in the University will be destroyed after one year.

**Aptitude Test.** The American College Test must be taken by all new freshman applicants during their junior or senior year in high school on a national test date. Arizona high school applicants should meet this requirement by taking the American College Test in their junior or senior year under the program approved by the Arizona Secondary School Principals' Association and the Arizona High School Superintendents' Association. Applicants for transfer who have not completed at least 24 semester hours of acceptable credit with a grade point average of 2.00 (C) or higher, must take the ACT test prior to admission. A report of the test scores must be sent to the Office of Registrar and Director

of Admissions directly from The American College Testing Program, P. O. Box 168, Iowa City, Iowa 52240.

**Medical History and Examination.** Every new student must have a physician send a report of medical examination on the Arizona State University examination form directly to the Office of Registrar and Director of Admissions in the envelope provided.

**Classification of Students.** Freshmen are those students who at the beginning of the academic year have less than 30 semester hours of credit; sophomores, those with 30 or more semester hours, but less than 60; juniors, those with 60 or more, but less than 90; seniors, those with 90 or more; graduate students, those holding a bachelor's degree from Arizona State University, or any other recognized institution.

**Academic Admission Requirements For New Freshmen**

**GRADUATION FROM AN APPROVED SECONDARY SCHOOL.** All applicants for admission to Arizona State University must have graduated with satisfactory scholarship from an accredited secondary school and must have completed a four-year secondary school course.

**SCHOLARSHIP REQUIREMENTS.** A resident of Arizona must have completed high school graduation requirements, and rank in the upper two-thirds of his high school graduating class; and a nonresident applicant must have completed high school graduation requirements and must rank in the upper one-half of his high school graduating class. On the basis of pre-admission counselling and testing, and the evaluation of special factors pertaining to academic suitability and

promise, admission may be granted in exceptional instances where the applicant has demonstrated the probability that he can successfully pursue a collegiate education.

**RECOMMENDED SECONDARY SCHOOL SUBJECT UNITS.** The following recommended pattern of subjects is that which, on the basis of experience, can reasonably be expected to provide satisfactory preparation for college when these subjects have been completed with better than average grades. Academically talented students are strongly urged to take additional courses from Groups I through V beyond those recommended. The definition of a unit is that used by the North Central Association of Colleges and Secondary Schools.

English ( <i>from Group I</i> )	4
or English 3 and one Foreign Language 2 ( <i>from Groups I and II</i> )	5
Mathematics ( <i>from Group III</i> )	2 2
American History and Social Studies ( <i>from Group IV</i> )	2 2
Laboratory Science ( <i>from Group V</i> )	2 2
Electives ( <i>from Groups I through VII</i> )	6
depending upon English option	5
	<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> 16 16

The recommended program of secondary school subject units meets the requirements for admission to freshman standing in all programs except the following:

The School of Engineering requires 3½ units in mathematics, including advanced algebra, geometry, and trigonometry. Calculus is recommended. The laboratory sciences chosen must include at least one unit in physics and one unit in chemistry. One unit of biology is strongly recommended.

The College of Nursing requires 2½ units of mathematics, including algebra, advanced algebra and one additional unit of mathematics. Laboratory sciences must include one unit of biology and one unit of chemistry or their equivalent. An additional unit of physics is recommended.

**Classification of Acceptable Secondary School Subjects**

- Group I. ENGLISH. Only courses with major emphasis upon grammar, composition and literary analysis.
- Group II. FOREIGN LANGUAGE. Classical or modern foreign language. Less than one unit is not accepted; two units or more are strongly recommended.
- Group III. MATHEMATICS. One unit of algebra and one unit of mathematics other than arithmetic, business mathematics or general mathematics.
- Group IV. SOCIAL STUDIES. History, civics, economics, sociology, geography, and government (including United States and Arizona Constitution.)
- Group V. LABORATORY SCIENCES. Only courses in biology, chemistry, and physics, in which at least one regular laboratory period is scheduled each week.
- Group VI. FINE ARTS. Historical, theoretical and performance courses in art, music, speech and drama, and humanities.
- Group VII. Agriculture, bookkeeping, general science, home economics, arithmetic, business arithmetic, general mathematics, journal-

ism, industrial arts, secretarial training, and other subjects commonly offered for credit by secondary schools, except physical education and military science.

**ADVANCED PLACEMENT.** Students who have taken a College Entrance Examination Board Advanced Placement Course in the secondary school, and who have taken the College Entrance Examination Board Advanced Placement Examination and received scores of 5 or 4, will receive University credit as well as advanced placement. Those students who receive a score of 3 may receive University credit and/or advanced placement after a review by the department concerned.

**TENTATIVE ADMISSION PRIOR TO GRADUATION FROM HIGH SCHOOL (FALL SEMESTER.)** A tentative admission commitment will be made to high school seniors who submit a seven-semester transcript which shows academic quality and rank in class in keeping with admission standards, and who complete all of the steps in the undergraduate admission procedures. A certificate of admission will be issued only when the complete transcript of the high school record showing final grade point average, rank in class and date of graduation has been received in the mail by the University directly from the high school. The tentative admission commitment will be cancelled if the final transcript is not received prior to August 1 showing that the student has met the University requirements for admission.

**Special Enrollment Permit for High-Ranking High School Seniors.** High school seniors under 21 years of age with only a limited amount of work remaining for completion of high school graduation, who rank in the top ten percent of their class, may be granted a

special enrollment permit to take not more than six semester hours at Arizona State University. To qualify for the special enrollment permit the following conditions must be met.

1. An application for the special enrollment permit must be submitted to the Office of Registrar and Director of Admissions.
2. An official transcript of the high school record showing senior standing and rank in class must be sent directly to the Office of Registrar and Director of Admissions by the high school.
3. The principal of the high school must send his written recommendation to the Office of Registrar and Director of Admissions authorizing the enrollment of the high school senior at Arizona State University at the same time the student is completing his high school program.
4. The student signs an agreement as a part of the application for the special enrollment permit, that he will continue in high school while enrolled in the limited program at Arizona State University and that he will graduate with his high school class.

**Academic Admission Requirements for Transfer Students.** Applicants for transfer admission who were eligible for admission to Arizona State University at the time of high school graduation, must have a grade point average of 2.00 (C) or higher for all work completed at previous institutions of higher education and be in good standing and eligible to return to those institutions.

Applicants for transfer admission who were ineligible for admission to Arizona State University at the time of high school graduation because of low scholarship or a combination of low scholarship and low achievement on the standard composite score of the American College Test, must have

completed at least 24 semester hours of transferable credit with a grade point average of 2.00 (C) or higher.

Students from accredited institutions of higher education ordinarily will be given credit, hour for hour, for work successfully completed in such institutions insofar as it applies to the requirements of the curriculum pursued at Arizona State University. Grades and scholastic honor points earned at other accredited colleges and universities, except for courses in which marks for incomplete, withdrawal, or credit (only) are given, are included in the calculation of the student's cumulative index at Arizona State University. This provision applies to all transfer students entering the University Fall 1971 and thereafter.

**COLLEGE-LEVEL EXAMINATIONS.** Students who have taken College-Level Examinations of the College Entrance Examination Board may receive University credit. To receive credit for the General Examinations, students must have received a standard score of 500 or higher. To receive credit for the Subject Examinations, students must have received a standard score of 50 or higher.

**CREDITS FROM JUNIOR COLLEGES.** Credits transferred from accredited junior colleges will be accepted up to a maximum of 63 semester hours. Additional credit may be accepted only upon authorization of the standards committee of the college in which the student is enrolled at Arizona State University. Junior college students planning to transfer to Arizona State University at the end of their first or second year should plan their junior college courses to meet the requirements of the curriculum selected. Students will be permitted to follow the degree requirements specified in the Arizona State University catalog in effect at the time they

began their junior college work providing their college attendance has been continuous. Courses transferred from junior colleges will not be accepted as upper division credit at Arizona State University.

**CREDITS FOR COURSES IN RELIGION.** Courses offered by the Tempe Religious Conference and other religion courses approved for transfer will be accepted for general elective credits at Arizona State University within the limits of the student's degree program. If such courses in religion are accepted in the area of General Studies in the student's degree program, they can count only as General Studies electives.

**CREDIT FOR MILITARY SERVICE.** *A Guide to the Evaluation of Educational Experiences in the Armed Services*, published by the American Council on Education, has been adopted by Arizona State University as a basis for evaluating only college-level training and experiences in the armed forces.

For active service for a period of at least six months and less than a year, terminated under honorable conditions in the United States Army, Navy, Marine Corps, Air Force or Coast Guard, the University allows two units of military science; for one year or more of active service, four units of military science; for a commission earned in the service, 12 upper-division units of military science.

Veterans must submit their records of service to receive credit for military service in the United States Armed Forces to the Office of Registrar and Director of Admissions.

Armed Forces records will not be evaluated as a part of the admission credentials. Veterans must be enrolled as full-time students before records of Armed Forces training and experience will be evaluated and

made a part of the student's file. Armed forces training and experience credit will be granted only if it applies to the curriculum in which the student is enrolled.

**UNITED STATES ARMED FORCES INSTITUTE CORRESPONDENCE COURSES.** Correspondence courses completed through the USAFI program will be accepted on transfer providing that satisfactory grades have been received. Official reports must be mailed directly to the Office of Registrar and Director of Admissions from USAFI, Madison, Wisconsin 53713. (For limitation of correspondence course work see page 258.)

**CONDITIONAL ADMISSION PRIOR TO RECEIPT OF FINAL TRANSCRIPT** (*Spring Semester Only*.) Students enrolled in other colleges or universities during the fall semester will be considered for admission for the spring semester on the basis of having met all admission requirements by December 22, except for the final transcript of work in progress. The final transcript must be received in the Office of Registrar and Director of Admissions directly from the registrar's office of the issuing institution no later than February 15. Final approval for admission will not be given prior to the receipt of the final transcript. Any registration procedures previously undertaken will be cancelled, and any registration fees paid will be returned if the students do not qualify. Such applicants must sign a statement agreeing to this procedure.

**APPEAL PROCEDURE.** Applicants for transfer admission who have failed to maintain a scholarship record acceptable to Arizona State University or who have been disqualified in the college or university previously attended because of scholarship, conduct or other reasons, will be denied admission. Students who are denied admission may appeal to the University Admissions Committee for a

reconsideration of their application. The decision of the University Committee will be final.

**Undergraduate Admission of Foreign Students.** For admission purposes, foreign students are defined as all persons who are not citizens of the United States.

Foreign applicants seeking admission to Arizona State University, in addition to meeting the requirements for regular admission either as a freshman or as a transfer student, must demonstrate their proficiency in the English language as one of the conditions for admission. The University requires all foreign applicants whose native language is not English to take the Test of English as a Foreign Language (TOEFL.) The scores must be submitted directly to the Office of Registrar and Director of Admissions from the testing center. Information and registration forms are available from the following address: TOEFL, Box 899, Princeton, New Jersey, U.S.A. 08540. Foreign applicants must also provide a personal data sheet in duplicate certifying that they possess adequate financial resources to support themselves while in residence at the University. Before foreign students embark for the United States, they must have a Certificate of Admission from Arizona State University.

Arizona State University has limited scholarship resources for undergraduate foreign students. Financial assistance will not be available during the first year. The University cannot provide on-campus employment to aliens. Arizona State law, under most circumstances, provides that noncitizens cannot be on the State payroll.

Every foreign applicant must have a physician send a report of medical examination on the Arizona State University form, directly to the Office of Registrar and Director of Admissions in the envelope provided.

Foreign students are required by the University to have insurance coverage against illness and accident before being permitted to register. Insurance must be maintained throughout the student's enrollment in the University and is available through the University at the time of registration. Other comparable insurance is also acceptable.

**Readmission to the University.** Former undergraduate students who have not been in continuous on-campus attendance at Arizona State University must obtain an application for readmission from the records section of the Office of Registrar and Director of Admissions. All readmission credentials must be submitted prior to August 14 for fall semester and prior to December 22 for spring semester. Official transcripts of all additional work taken elsewhere must be sent directly to the Office of the Registrar and Director of Admissions at Arizona State University from the office of the registrar at the issuing institution. Failure to report intervening college or university attendance at the time of application for readmission is considered misrepresentation and falsification of University records and is sufficient cause for cancellation of the student's enrollment, of any credits earned, or both.

Students must be in good standing at all institutions attended since last enrolled at Arizona State University. Students whose cumulative grade point index is below that required for good standing will be denied readmission. (See Grade Point Index Required for Good Standing, page 20.) Students who have been denied readmission may appeal to the University Admissions Committee.

**CONDITIONAL READMISSION PRIOR TO RECEIPT OF FINAL TRANSCRIPT** (*Spring Semester Only*). Students enrolled in other

colleges or universities during the fall semester will be considered for readmission for the spring semester on the basis of having met all readmission requirements by December 22, except for the final transcript of work in progress. The final transcript must be received in the Office of the Registrar and Director of Admissions directly from the office of the registrar of the issuing institution, no later than February 15.

Final approval for readmission will not be given prior to the receipt of the final transcript. Any registration procedures previously undertaken will be cancelled, and any registration fees paid will be returned if the students do not qualify. Such applicants may be asked to sign a statement agreeing to this procedure.

**Admission to Summer Sessions.** The same admission standards must be followed for summer sessions as apply to the regular semesters for those students who plan to pursue degree programs at Arizona State University. Transient students — those pursuing degree requirements at other colleges and universities — will be permitted to enroll in the summer sessions without admission. Only those non-high school graduates who meet the provision outlined in the section, Special Enrollment Permit for High-Ranking High School Seniors, will be permitted to enroll in summer sessions.

**Registration.** (Only Students Who Have Been Admitted or Readmitted May Register)

**CURRICULUM ADVISEMENT AND COURSE SELECTION.** Assignment of an advisor will be made in the office of the department or college which offers the major in which the student is enrolled or desires to enroll. Students who are new to the Arizona State University campus will receive special

instructions on orientation, advisement and registration for new students.

Faculty advisors counsel with students on matters pertaining to academic goals, major field of specialization, graduation requirements, selection of courses, and registration. Particular emphasis is given to advisement during the student's first year on campus; however, advisors provide continuing academic counseling throughout students' academic careers.

Specific advisement policies and practices differ among the several colleges in the frequency of required advisement and in the flexibility allowed the student in selecting courses. Each student should follow advisement practices of his college and department.

Students are primarily responsible for meeting requirements for degrees and professional certificates and for seeking advisement. All students, therefore, should read the appropriate sections in the *General Catalog* to become familiar with the programs and courses offered, and should consult the current *Schedule of Classes* for information on special advisement periods.

Classes are scheduled in an extended day program which covers morning, afternoon and evening hours, Monday through Friday, and morning hours only on Saturday. Full-time students are expected to devote both mornings and afternoons five days per week to their program of studies.

**REGISTRATION DATES** Students must register and pay fees on the registration dates announced in the University calendar. (See pages 6-7.) Late registration continues only through the first four (4) days of classes of each semester.

**UNIT OF CREDIT.** The semester hour is the unit of credit. It represents one 50-minute course exercise per week per semester,

which requires at least two hours of outside preparation.

**COURSE LOADS.** Students carrying 12 or more semester hours of work are classified as full-time students. The maximum load for which a student may register is 18 semester hours, except for students enrolled in the Colleges of Architecture and Engineering Sciences. The maximum student load in these colleges is 19 semester hours. Students who wish to register for more than these maximums must petition the standards committee of the college in which they are registered. During the semester in which a student is enrolled for student teaching the load may not exceed 16 semester hours unless prior approval has been granted by the College of Education.

Students must not be enrolled either during the academic year or in summer sessions at any other institution or extension class when in regular attendance at Arizona State University unless prior approval has been granted by the standards committee of the college in which the student is enrolled.

**AUDIT ENROLLMENT.** Persons wishing to audit courses will register in the regular manner and pay the regular fees. These courses are counted in the student's load; however, no credit is given for audited courses, and only the mark of X will be recorded. Audit enrollment cannot be changed to credit enrollment nor credit enrollment to audit enrollment after the close of the drop-add period.

**PASS-FAIL ENROLLMENT.** The pass-fail option is available in the College of Liberal Arts. (See page 52.)

**STUDENT IDENTIFICATION CARDS.** Each enrolled student is required to have in his possession at all times a currently validated

photo identification card. This card will be provided the student at the time of registration, and will be subsequently validated for each semester he enrolls. A "Student Activity sticker" will be affixed to the back of the photo identification card of each student carrying more than six credit hours. Students who withdraw from the University must surrender the photo identification card to the Business Office before his withdrawal can be processed. Lost or mutilated cards must be reported to the University Business Office. A charge of \$10.00 will be made for replacement.

**DRAFT BOARD NOTIFICATION.** A Selective Service information card is placed in the registration packet for the convenience of all male students. Those students who wish to have their draft board notified of their student status must complete this card and submit it to the Office of Registrar and Director of Admissions. To qualify as a full-time student for Selective Service classification purposes, each year male undergraduate students must enroll for and complete one-fourth of the number of semester hours required for a four-year degree program. Thus, male undergraduate students subject to the draft must be registered for a minimum of 12 hours each semester and complete a minimum of 30 semester hours during the 12-month period following the beginning of the fall semester.

**VETERANS BENEFITS.** Arizona State University is fully approved for the training of students under the several government educational programs for veterans and dependents of deceased or disabled veterans. Eligible students should apply directly to their nearest Veterans Administration office for information concerning benefits to which they are entitled. Qualified veterans or vet-

erans' dependents will present the required Certificate of Eligibility at the Veterans' window in the Moeur Administration Building. The Certificate of Eligibility is required before the University can arrange with the Veterans Administration to have benefits made available to individual students. At the time certificates are filed, students will receive instructions regarding application, payroll clearance and other important information connected with the program.

**COMPREHENSIVE EXAMINATIONS.** The purpose of the comprehensive examination is to permit the student an opportunity to establish credit in a field in which he has had adequate preparation or experience, but in which he has not received academic credit. To provide a procedure by which this may be accomplished, the following rules are applicable:

Comprehensive examinations may not be taken in any course for which the student has received admission or transfer credit from any educational institution. Admission and transfer credit are established through the Admissions Office.

Comprehensive examinations may not be taken in the elementary level of a field in which the student has received credit for advanced work. This includes the prohibition of comprehensives in courses required as prerequisites for a course in which the student has received credit.

Students desiring credit by comprehensive examination should indicate their desire to take such examinations during their first two semesters in residence at Arizona State University. No comprehensive examinations will be given to students who have accumulated 100 or more semester hours of credit.

A student may establish a maximum of 30 semester hours of credit by comprehensive examinations and/or correspondence courses.

Only matriculated students may petition to establish credit by examination.

Applications will be accepted only for courses listed in the current University catalog, and only for courses in which a comprehensive examination is regarded as a satisfactory measure of accomplishment.

The fee for such examination shall be \$7.50 per semester hour of credit. An examination may cover only one course. For example, English 101 and 102 are two courses requiring separate examinations. No examination will be prepared until the fee is paid.

An application blank may be secured from the office of the chairman of the department in which the course is offered. The student will fill out the application giving the number, title and the number of semester hours of credit for the course in which an examination is desired. The completed application shall carry the recommendation of the student's advisor. The application is filed with the chairman of the department in which the course is offered, and his approval to take the examination must be granted.

Ordinarily, an application will be approved for only one course at a time. If a student applies for examinations in sequence of two closely-related courses, such as English 101 and 102, permission may be granted to take the second examination upon successful completion of the first.

The number of hours of credit granted shall be the hours specified for the course in the current catalog.

All examinations shall be of a comprehensive type. They shall be prepared and graded by the instructor of the course and the head of the division or chairman of the department and filed in the Records Section.

Examinations will be administered through the office of the chairman of the department

in which the course is offered.

Letter grades of A, B, C, D and E will be used in grading examinations. If the grade is A, B or C, a grade of CR will be entered on the student's permanent record. If the grade on the examination is D or E no entry will be made on his permanent record. Entries on the permanent record of credit by examination shall be so indicated. The student will be notified of the result of the examination. The student will not be given a second opportunity to establish credit by examination for the same course.

**PROFICIENCY EXAMINATIONS.** A proficiency examination may be required for the waiver of a course requirement or for the validation of transfer credits in professional programs.

Information regarding policies and regulations governing the waiver of course requirement or validation of transfer of credits in professional programs may be obtained from the office of the dean of the college in which the student is registered.

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REGISTRATION IS NOT COMPLETE  
UNTIL ALL FEES HAVE BEEN PAID

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**Changes in Enrollment.** Course programs should be carefully planned under the guidance of the curriculum advisor so that once registration has been completed, changes in enrollment will not be necessary. After a student is enrolled, changes may be made in his course program only through the Office of Registrar and Director of Admissions by means of a drop-add form. Drop-add forms may be obtained at the locations designated in the *Schedule of Classes*. Changes may be made as late as the fourth day of classes for the two regular semesters. Changes during summer sessions may be made only through the second day of classes.

The courses for which a student is registered at the close of the late registration period constitute his official enrollment and semester load. A student may officially drop a course or courses from his approved program of studies after the close of the drop-add period and before the end of the first six weeks of a semester. In such cases the mark of W will be recorded.

Withdrawals from individual courses after the first six weeks of the semester will be considered on an individual basis by the class instructor, curriculum advisor and the dean of the college in which the course is offered. The recorded grade will be W or E in accordance with the student's status at the time of withdrawal. No student will be permitted to drop a course after Monday of the week prior to final examinations.

A student who quits a course for which he is officially registered by absenting himself from class will run the risk of receiving the grade of E at the end of the semester.

To drop a course the student will obtain from the Office of the Registrar and Director of Admissions an Authorization for Dropping Course form and process it according to the instructions on the form.

**WITHDRAWAL FROM THE UNIVERSITY.** Students who find it necessary to withdraw from the University should withdraw officially by obtaining and completing an official withdrawal card from the Office of Registrar and Director of Admissions.

Until a student withdraws officially, he is registered in all courses and will at the end of the semester receive grades appropriate for his performance in each course. A student who officially withdraws from the University during the first six weeks of a semester receives the mark of W in all courses for which he is registered. Students who officially withdraw from the University later than the

sixth week will receive a mark of W or E, depending upon the quality of the work at the time of the official withdrawal. No student will be permitted to withdraw after Monday of the week prior to final examinations.

**The Grading System, Retention and Academic Standards**

**Grading System**

SCHOLARSHIP GRADES AND MARKS. Scholarship grades and marks are indicated by the letters and explanations given below. All grades and marks will appear on report cards and the permanent record.

- |               |                |
|---------------|----------------|
| A – Excellent | E – Failure    |
| B – Good      | Y – Credit     |
| C – Average   | W – Withdrawal |
| D – Passing   | I – Incomplete |
| P – Pass      | X – Audit      |

PASS-FAIL COURSES. Where permitted by the college in which the student is enrolled and where permitted by the college in which the course is offered, any undergraduate student who has completed at least 60 hours credit and is enrolled for 12 or more semester hours of work may elect to take one course on a pass (P) or fail (E) basis each semester if approved by his advisor. This course must not be in his major field or required related subjects. During the summer terms, one course for pass or fail may be taken if the student is enrolled in at least six semester hours of work. (Some colleges may not permit pass-fail enrollment or may have more restrictive requirements. Refer to appropriate sections in catalog.) No student may apply toward graduation more than 16 semester hours of undergraduate work in which a P was received.

MARK OF CREDIT. Each college or school within the University may elect to assign a course for credit (Y) or failure (E). The Y-E grade is appropriate for seminars, internships, projects, dissertations, workshops, thesis, readings and conference, and research.

MARK OF INCOMPLETE (I). A mark of I is given only when a student who is otherwise earning a passing grade is unable to complete a course because of illness or other conditions beyond the control of the student. Negligence or indifference are never accepted as reasons for giving an I. It is the sole responsibility of each student receiving a mark of incomplete to contact the instructor or dean of the college in cases where the instructor is no longer available, and complete the course within one calendar year. Additional time may be granted at the discretion of the instructor when unusual conditions warrant such an extension. If an I is not thus removed, the instructor is expected to change the incomplete grade to an appropriate grade. If he chooses not to change the I, it becomes a part of the student's permanent record.

MARK OF WITHDRAWAL (W). The mark of W is given in a course whenever a student (1) officially drops from a course or withdraws from the University during the first six weeks of the semester; (2) officially drops a course or withdraws from the University after the first six weeks if passing at the time. (See page 18.)

REPETITION OF COURSE. Undergraduate students may repeat any course in which a grade of D or E was received. When a course is repeated the original grade remains on the student's record and is included in his cumulative scholarship index. A course, however, may be counted only once in meeting the

hours for required majors, minors or graduation. A student may by formal application to the Registrar, request that a grade of D or E not be included in his cumulative index after he has repeated the course in residence with a passing grade and prior to completion of a bachelor's degree.

CHANGE OF GRADE. A grade once reported to the Registrar's office may within one year be changed only (1) upon the authorization of the faculty member issuing the original grade or (2) when the instructor cannot be reached, by the standards committee of the college in which the course was offered. In either case, the approval of the dean of the college concerned is required.

A change of grade is made by filing an Authorization of Change of Grade form with the Registrar's office. The reason for the change of grade shall be entered on the form and signed by the faculty member, his department chairman, and the dean of the appropriate college.

GRADE POINTS. For the purpose of computing the scholarship index, grade points are assigned to each of the grades as follows: A, 4 points for each semester hour; B, 3 points; C, 2 points; D, 1 point; and E, 0 points.

SCHOLARSHIP INDEX. The scholarship index is obtained by dividing the total number of grade points earned by the number of semester hours in the student's course load. Courses in which grades of P (pass), W (withdrawal), I (incomplete), Y (credit) and X (audit) are received are not included in determining the scholarship index.

DEFICIENT SCHOLARSHIP REPORT. Students receiving grades of D or E at mid-semester will receive a Deficient Scholarship Report.

GRADE REPORT TO STUDENTS. Grade reports of all students showing their standing in

each class are mailed to their local addresses at the end of the fall semester and their home addresses at the end of the spring semester and summer sessions. It is therefore urgently necessary that each student keep the Office of the Registrar informed concerning his correct addresses. Address changes should be in the Records Section of the Office of the Registrar at least four weeks prior to final examinations.

**REPORTS TO ARIZONA HIGH SCHOOLS AND/OR JUNIOR COLLEGES.** A copy of the semester grade report of each student is sent to the Arizona high school from which he graduated and/or the Arizona junior college from which he transferred.

### **Retention and Academic Standards**

**INSTRUCTORS MAY DROP STUDENTS FROM COURSE.** A faculty member may drop a student from his class with a grade of E when the student's progress or conduct justifies the action, which will usually be based on one of the following: (1) absences for reasons not justified, (2) conduct detrimental to other members of the class, and (3) lack of achievement or progress. A student who thinks that he has been unjustly dropped may appeal to the standards committee of the college in which the course is offered.

**GRADE POINT INDEX REQUIRED FOR GOOD STANDING.** In order to be classified in good standing, a student who has earned 29 semester hours or less must have at least a 1.60 grade point index; a student who has earned 30 semester hours — but less than 60 semester hours — must have at least a 1.75 grade point index; and a student must have achieved a 2.00 grade point index no later than the semester in which he has earned a total of 60 semester hours. To remain in good standing, a student with over 60 hours or more of

credit must maintain a cumulative average of 2.00. Any college may establish higher grade point standards for one or more of its programs. The grade point index is computed on the basis of courses taken at the University and those accepted for transfer including failing grades.

**PROBATION.** Any student who is not in good standing will be placed on probation at the end of the semester in which the standard is not met. A student on academic probation is required to observe any limitations or rules that his college may require as a condition for retention. Once a student is on academic probation, he remains in that status until his grade point index reaches the retention level or he is disqualified from the University.

**DISQUALIFICATION.** Students who are placed on probation at the end of a semester are subject to disqualification at the end of the following semester if the satisfactory grade point index is not obtained. Disqualification

is within the discretionary power of the standards committee of his college. A student who receives notice of disqualification may appeal to his standards committee. If the application for reinstatement is approved, the student will not be dropped from the University. If the reinstatement is denied, the student must remain out of school for at least one semester.

Any student who has earned the semester hours required for graduation in his college but has not achieved the minimum index required for graduation, is subject to disqualification unless the standards committee of his college recommends that he not be disqualified.

Students placed on probation or disqualified by a college are notified by the office of the dean in the college in which the student is enrolled.

**REINSTATEMENT.** A disqualified student may submit an application for reinstatement to



University Mall Scene

the college in which he was last enrolled. If he wishes to transfer to another college within the University for which his aptitudes and qualifications may be more suitable, he should make his application for reinstatement to the University Admissions Committee. A disqualified student is responsible for providing evidence of ability to bring his academic record up to a satisfactory standard. He may be required to take aptitude tests or receive vocational counseling before being readmitted into a different college.

A disqualified student normally will not be reinstated until at least one semester has elapsed from the date of disqualification. In order to be considered in time for readmission to a particular semester, an application for reinstatement must be submitted well in advance of the dates required for readmission.

A student who clearly indicates on his application for reinstatement that he wishes to be heard in person will be given an appointment for interview by the standards committee that is to consider his case. It is the student's responsibility, however, to make any travel arrangements or adjustments in his work schedule that may be necessary for scheduling the interview.

A disqualified student should apply for reinstatement before filing an application for readmission at the Registrar's office. Reinstatement application forms should be obtained from the college in which the student was last enrolled.

**APPEALS.** Students who wish to appeal the decision of a standards committee of a college may make application for a hearing at the University Admissions Committee. Actions on appeals before the University Admissions Committee will be communicated to the student by the Office of the Registrar and Director of Admissions.

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## Student Membership in the University

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Upon an individual's admission, Arizona State University agrees to provide the advisement, instruction, and services to a student during the course of his enrollment in the academic community. These offerings are set forth in the University's published catalogs, bulletins and official notices. Attendance at the University is a voluntary entrance into the academic community and the student voluntarily assumes obligations of performance and behavior compatible with the institution relevant to its lawful role, processes and functions

Under the Constitution and laws of the State of Arizona, jurisdiction and control over Arizona State University are vested in the Arizona Board of Regents. The Board of Regents and its agents—the president, administration and faculty—are granted broad legal authority to regulate student life, subject to basic standards of reasonableness. In exercising this authority, the University is guided as well by considerations of educational policy.

In developing responsible student conduct, the University prefers counseling, guidance, admonition and example. However, when these means fail to resolve problems of student conduct and responsibility, charges may be heard by the University Trial Board, whose members are students and teaching faculty, to determine if there has been a violation of pre-defined standards of conduct. On the basis of its findings, among the sanctions that the Board may prescribe are the following: (1) warning, (2) admonition, (3) censure, (4) reprimand, (5) suspension

of or forfeiture of campus privileges for a definite period of time, (6) probation for a definite period of time, (7) suspension for a definite period of time, and (8) expulsion.

The student has the right to make timely appeal of the Board's decision upon the following grounds: (1) prejudicial error committed during the hearing whereby the aggrieved was deprived of a fair trial, (2) noncumulative material and relevant evidence, new or newly discovered, which, with reasonable diligence, could not have been produced at the trial, (3) the decision or judgment is not supported nor justified by the evidence, and (4) the penalty or sanction imposed was excessive. Pending final action on charges brought against a student by the University the status of a student is not altered; nor is his right to attend classes suspended, except for reasons relating to the safety of students, faculty or University property.

The immediate concern of the University is with student behavior on campus and at University-sponsored events off campus.

Misconduct for which students are subject to University discipline falls into the general areas of:

- (1) academic dishonesty—cheating in examinations, laboratory work, written work (plagiarism), forging or altering University records—that is, any attempt to gain credit for work not performed by the student;
- (2) action endangering the safety of others and self;
- (3) disrupting the necessary peaceful processes of the University; and
- (4) theft or destruction of property.

Details of expected student conduct are further elaborated in the *Code of Conduct*.

## Fees, Deposits and Expenses

**Changes in Fees.** The Board of Regents reserves the right to change fees and charges when necessary without notice.

**Extending Credit.** The University cannot extend credit; therefore, students must have sufficient funds on hand when registering to pay for nonresident tuition, registration, incidental fees and books. Room and board may be paid in installments, the first payment being due prior to registration.

**Definitions.** *Regular fees* are those paid by all students. *Special fees* are those paid by certain students only, and under the conditions indicated.

**Deposits** are made to cover certain contingencies. All or part of the deposit may be returned depending upon the charges incurred by the student.

### General Summary

Summary of minimum annual expenses:

General University Fees .....	\$ 320.00
Books and supplies .....	100.00 <sup>†</sup>
Total minimum cost to Arizona resident residing off campus .....	\$ 420.00
Room and Board .....	1,070.00* <sup>†</sup>
Total minimum cost to Arizona resident residing on campus .....	\$1,490.00
Nonresident tuition .....	890.00
Total minimum cost to out-of-state resident residing on campus .....	\$2,380.00

All students should add to this list incidental personal expenses as needed plus special fees and deposits.

\*Rates vary depending on the dormitory in which a student resides and on the basis elected for meals in the University cafeteria.

<sup>†</sup>Figures are approximate.

### Regular Fees

These fees are paid each semester by all students with the exception of those registering for Extension and Correspondence courses.

General University Fee .....	\$160.00
<i>(Covers registration for more than six (6) semester hours.)</i>	
Registration Fee (per semester hour) .....	\$ 18.00
<i>(Registration for six (6) semester hours or less.)</i>	
Minimum Registration Fee .....	\$ 18.00

### Special Fees

Special fees are paid by certain students under the conditions given below:

Admission Application Fee (nonresident applicants) .....\$10.00

All undergraduate applicants for admission, residing out of the State of Arizona, must pay a non-refundable admission application fee at the time application for admission is made.

Tuition for Nonresident Students (per semester) .....\$445.00

Students who are not legal residents (as defined below) of the State of Arizona are required to pay the nonresident tuition fee in addition to registration fees. Provisions governing the assessment of the nonresident tuition fee have been adopted by the Board of Regents as follows:

1. Every nonresident student carrying 12 or more units in day, late afternoon, and/or evening courses on campus, except graduate assistants, shall be required to pay a nonresident fee of \$445.00 per semester. Those carrying 7 through 11 units will pay a nonresident fee of \$37.00 per unit of work carried. This fee is in addition to other listed fees. The nonresident fee is waived for students carrying fewer than 7 units of work. Nonresident graduate students also pay the tuition fee. Graduate assistants, however, are exempt from the nonresident tuition fee and from laboratory or other fees applicable to courses in the student's major.

2. A student to be considered a legal resident of Arizona for the purpose of registering at Arizona State University must meet the requirements and must present evidence thereof as follows:

A. If under 21 years of age — that the parent (or guardian) having legal custody of the student has been a legal resident of the State of Arizona for at least one year next preceding the last day of registration for credit.

In the event that a legal resident of Arizona is appointed guardian of a nonresident minor, the application of the minor for classification as a resident student must be supported by a certified copy of the letters of guardianship issued by an Arizona Superior Court and the affidavit

of the guardian that the minor has an estate within this state.

B. If over 21 years of age — that legal residence in the state has been established (independently of the circumstance of attendance at an Arizona institution of learning) for at least one year next preceding the last day of registration for credit, and that he is eligible to become a registered voter. (Sec. 3 of Art. 7, Constitution of Arizona provides, "For the purpose of voting, no person shall be deemed to have gained or lost a residence . . . while a student at any institution of learning . . ."; Sec. 6, Art. 7 provides, "No soldier, sailor or marine . . . shall be deemed a resident of this state in consequence of his being stationed at any military or naval place within this state." These constitutional provisions apply to establishment of residence in Arizona for tuition purposes.)

C. If a Resident Alien — that the relevant requirements of A or B above have been met by the student and/or his parents, except that pertaining to voting eligibility.

3. The student must have the question of his legal residence passed upon previous to registration and payment of fees. The responsibility of registration under proper residence is placed upon the student. The Residence Affidavit must be completed and filed prior to any adjudication of residence. The Affidavit is required upon original registration, or upon a desired change in classification, or after an absence for more than a single semester. If there is any question as to legal residence, the matter should be brought to the attention of the University Registrar and passed upon previous to registration and payment of fees. A sworn statement of the facts is required, and a form for the purpose is provided at the time of registration. In all cases where the records indicate that the student's legal residence is outside of Arizona, the nonresident fee shall be assessed. Any student found to have made a false or misleading statement concerning his legal residence shall be subject to dismissal from the University.

4. The University has a Committee on Legal Residence. The Registrar or his authorized representative may, during the registration period, or at other times refer certain cases to the committee provided the question of legal residence requires further review and additional information. A student who believes the decision regarding his legal residence classification is not consistent with the regulations adopted by the Board of Regents may appeal his case to the Legal Residence Committee. A student's request for appeal should include a written statement of all facts relative to the matter and he may be given an opportunity to appear before the committee. Appeals and claims for refund may be filed at any time within 30 days from the date of registration.

**Private Music Instruction**

In addition to the usual University Registration Fees, the following fees are charged for private music instruction:

½ hour lesson per week (per semester) . . . . . \$27.00

1 hour lesson per week (per semester) . . . . . \$40.00

Music majors will pay a flat fee of \$40.00 when registering for one or more hours of private instruction.

Special Law Fee (per semester) . . . . . \$32.00

College of Nursing Examination Fee . . . . . \$ 8.00

To cover cost of the Graduate Nurse Examination (GNE)

**Field Study and Field Trips**

A special fee may be charged for field study or field trips to cover travel, meals and lodging. Arrangements for the payment of such fees will be made in advance with the student.

Transcript Fee . . . . . \$ 1.00

Requests for transcripts should be made to the Registrar and Director of Admissions one week in advance of time desired.

**Senior Check-Out**

Each senior is entitled to one official check-out, at the time application for graduation is filed, without charge, under the curriculum designated in his application for graduation. A fee of \$1.00 will be charged for any additional check-outs.

**Auditor's Fee**

Those taking courses for audit will register and pay the regular fees.

Graduate Entrance Examination Fees . . . . . \$3.50 to \$10.00

Not required of all applicants. When applicable, the prospective student will be notified by the office of the Dean of the Graduate College.

Master's Thesis Binding Fee . . . . . \$ 5.00

Education Specialist Report Binding Fee . . . . . \$ 10.00

Doctoral Dissertation Binding Fee . . . . . \$ 10.00

Doctoral Dissertation Registration Fee . . . . . \$160.00

A graduate student must be registered on a full-time basis for a minimum of two semesters for dissertation at full semester fee, and be registered in the semester in which the degree is granted, beginning with the fiscal year July 1, 1962.

Doctoral Dissertation Micro-Film Fee . . . . . \$ 30.00

Special Examination Fee . . . . . \$ 1.00

When, because of absence, or for any reason, it becomes necessary for a

Palo Verde Residence Hall Complex



student to request a special examination in any course, a fee of \$1.00 may be required for this special privilege.

Comprehensive Examination Fee (per semester hour) . . . . \$ 7.50

Paid by all students seeking to establish credit by examination.

Test Fees (Vocational) . . . . . \$ .50

A nominal fee is charged to pay the cost of test materials only.

Graduation Fees . . . . . \$ 5.00

A graduation fee in the amount of \$5.00 applies if paid on or before the dates specified in the section of the catalog headed Graduation Requirements. After that date, the fee is \$10.00.

Cap and Gown Rental Fee . . . . . \$4.75 to \$ 10.50

Bachelor's cap and gown for baccalaureate and commencement exercises, \$4.75. Master's cap, gown and hood, \$9.50. Education Specialist cap, gown and hood, \$10.50. Doctor's cap, gown and hood, \$10.50. These are approximate amounts and subject to change.

Fee for Dropping Course . . . . . \$ 1.00

Charged following last day of registration.

Fee for Replacing Registration Materials or Receipt . . . . . \$ 1.00

Fee for Duplicating Lost Identification Card . . . . . \$ 10.00

### Late Fees

Late Registration . . . . . \$ 10.00

All students, excepting those registering for night classes only, who register on the date specified for the beginning of classes, or thereafter, pay this fee.

Late Aptitude Tests . . . . . \$ 2.00

Paid by students taking the aptitude tests on the date specified for the beginning of classes or thereafter.

Late Physical Examination . . . . . \$1.00 to \$ 3.00

Charged beginning at noon of the last day scheduled for registration.

Late X-Ray . . . . . Actual Cost

Charged all students who fail to take the X-ray on the date specified by the University.

### Deposits

Deposits are required of those students wishing certain privileges or services. The deposits are returnable less any charges which may have been incurred during the term of the services being rendered. See page 25 pertaining to forfeiture of refunds.

#### Science Breakage Deposits.

All chemistry laboratory courses require a science breakage deposit ranging from \$5.00 to \$25.00. If breakage exceeds the initial deposit, an additional amount will be required.

Military Uniform Deposit . . . . . \$ 25.00

Deposit refunded upon return of uniform in good condition.

Student Housing Deposit . . . . . \$ 50.00

Reservations for rooms are obtained by filing an application and \$50.00 deposit with the Housing Office. See below pertaining to forfeiture of refunds.

**Room and Board Expenses**

Payment for residence halls may be made in advance for the entire semester, or on an installment schedule as outlined in the Housing Contract.

The advance should be paid prior to registration by sending a check to the ASU Business Office. Please indicate the student's full name, social security number, specific hall assigned to, and purpose of the payment.

**Meal Tickets.** The Memorial Union Dining Hall offers meal tickets on a 5-day or 7-day basis with additional servings at no extra cost. Several other options are available. Individual meals are available a la carte at a higher rate.

**Housing.** Rooms are available in the University residence halls at rates listed below:

<i>Halls</i>	<i>Academic Yr. Rate</i>
Gammage, Irish	\$ 400.00
Hayden	\$ 442.00
M. O. Best, McClintock, Wilson	\$ 462.00
Palo Verde and Manzanita (includes meals served 5 days per week)	\$1,070.00

**Payment and Refund of Fees**

**Refunds (Rent and Board).** Refunds to students departing from residence halls prior to the end of the academic year are computed on the following basis:

- (a) *Deposit:* Students forfeit their \$50.00 room deposit when check-out occurs prior to the last week of the spring semester.
- (b) *Rent:* Students will be charged 10 per cent of the total semester rate for each week or partial week of registered occupancy up to the tenth week of the semester.
- (c) *Board:* Departing students shall be charged for meals through the day in which formal check-out occurs. Students departing during the last two weeks of the semester shall be charged the full semester rate for meals. No refunds are made for meals missed

at any time prior to the end of the charge periods as indicated above.

**Payment of Fees.** The payment of fees cannot be deferred. By regulations of the Board of Regents based on a ruling of the Attorney General, registration and other University fees are payable on the day of registration.

**Method of Payment.** Payments to the University should be made by currency, travelers check, bank money order, cashier's check, or certified check. Personal or company checks requiring change will not be accepted during registration and during a period of one week preceding and two weeks immediately following registration. Personal or company checks in the exact amount of charges being collected by an individual cashier will be accepted. (Separate cashiers are used on registration, bookstore, board and room charges.)

**Refunds (Activities and Other Fees Including Laboratory).** Students withdrawing from school or dropping classes will receive a refund based on a percentage of the total semester fees paid, in accordance with the following schedule:

	<i>Percent</i>
1 thru 14 days	80
15 thru 21 days	60
22 thru 28 days	40
29 thru 35 days	20
After 35th day	None

The days referred to are calendar days, beginning with the first day college classes begin. Per cent of refund will be determined by date refund is applied for in the Business Office.

*Exceptions:* (1) In case an applied music course is dropped, because of illness or other emergency beyond the control of the student, not more than half of the special fee paid may be refunded. (2) The above refunds do not apply to Summer Session.

If the last day of the refund period falls on a Sunday or holiday, the refund must be picked up during the regular office hours on the preceding day.

**Forfeiture of Refunds.** All refunds and deposits due students for any reason whatsoever will be forfeited unless called for on or before June 30 of the college year in which they are due. Refunds will not be made without student receipt card. Should June 30 fall on Sunday or on a day when the Business Office is closed, the refund will be made on the next business day.

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## Reserve Officers Training Corps (ROTC)

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Arizona State University offers basic and advanced courses in Military Science and Aerospace Studies. The basic courses are designed to provide training in basic leadership techniques, to develop an understanding of the roles of the Army or Air Force in the defense of the United States, and to prepare the student for the advanced courses. The advanced courses, offered only to selected students, provide training which qualifies the student to perform the duties of commissioned officers in the Army or Air Force. Upon graduation, each student who satisfactorily completes the advanced course will receive a commission in the Army or Air Force Reserve.

### Aerospace Studies (Air Force ROTC)

**Purpose.** The Department of Aerospace Studies Curriculum consists of the General Military Course (GMC) and the Professional Officer Course (POC). The goal of this professional education is to provide the foundation of military knowledge and skills needed by an Air Force Second Lieutenant entering on active duty. Upon graduation, each student who satisfactorily completes the Professional Officer Course and degree requirements will receive a commission in the Air Force Reserve.

**General Qualifications.** A student entering AFROTC must: (1) be a citizen of the United States (noncitizens may enroll, but must obtain citizenship prior to commission-

ing); (2) be of sound physical condition; (3) be at least 17 years of age. If designated for pilot training, be able to complete all commissioning requirements prior to age 26½ (otherwise, be able to complete all commissioning requirements prior to age 30).

**Qualifications for Admittance to Professional Officer Course.** (1) For the four-year student, successfully complete the General Military Course. (2) For the two-year applicant, complete a six-week field training course. (3) Pass the Air Force Officer Qualification Test (AFOQT). (4) Pass the Air Force physical examination. (5) Maintain a minimum grade point average of 2.0 ("C").

**Four-Year Program.** In the four-year program, the qualified college student normally enrolls in the Air Force ROTC during his freshman year at the same time he enrolls in his other college courses. He pursues the General Military Course (GMC) during his first two years. GMC students receive 1.0 semester hours of credit for each hour of class and each hour of Leadership Laboratory period completed during his freshman and sophomore years, a total of 8.0 semester hours. If he desires to earn a commission, the student must pass an Air Force aptitude test and physical screening and be selected by an interview board of Air Force officers. If selected, the student then enrolls in the Professional Officer Course (POC) – the last two years of the Air Force ROTC curriculum. He normally attends a four-week field training course between his sophomore and junior year at an Air Force base. Upon successful completion of the POC and the college requirements for a degree, the student is commissioned in the U. S. Air Force as a second lieutenant. The new officer then enters active duty or is granted an educational delay to pursue graduate work.

**Two-Year Program.** The basic requirement for entry into the two-year program is that the student have two academic years of college work remaining, either at the undergraduate or graduate level, or a combination of the two. Applicants seeking enrollment in the two-year program must pass an Air Force aptitude and Air Force medical examination, and be selected by an interview board of Air Force officers. After successfully completing a six-week field training course at an Air Force Base, the applicant may enroll in the Professional Officer Course in the Air Force ROTC program. Upon completion of the POC and the college requirements for a degree, the student is commissioned in the U. S. Air Force as a second lieutenant. Unless he is granted an educational delay to pursue graduate work, he may enter active duty shortly after graduation.

**Pay and Allowances.** POC members in their junior and senior years receive \$50 per month for 20 months of Professional Officer Course attendance. Students are also paid to attend field training at the rate of one-half the basic pay of a second lieutenant (approximately \$210 per month). Uniforms, housing and meals are provided during field training at no cost to the student. Students are reimbursed 6c per mile for travel to and from field training.

**Scholarships.** Air Force ROTC offers approximately 1,000 scholarships annually to outstanding young men and women on a nationwide competitive basis. Scholarships cover full college tuition for resident and nonresident students as well as books, fees, supplies and equipment, plus a monthly tax-free allowance of \$50. Scholarships are available on a four-, three-, two- and one-year basis. To qualify for the four-year scholarship, the student must be a male

citizen and submit an application prior to 14 November of his senior year in high school. Interested students should consult their high school counselors for application forms to be submitted to HQ, AFROTC, Maxwell AFB, Alabama. Male and female students enrolled in AFROTC at Arizona State University are eligible for three-, two- and one-year scholarships. Those interested must apply through the Department of Aerospace Studies located in Old Main. Consideration is given to academic grades, score achieved on the Air Force Officers Qualifying Test and physical fitness. A board of officers considers an applicant's personality, character and leadership potential.

**Draft Deferment.** Students enrolled in freshman and sophomore AFROTC General Military Courses normally receive student draft deferments. Freshmen and sophomores on AFROTC scholarships and juniors and seniors who qualify for and are enrolled in the Professional Officer Course are granted deferment from induction by local Selective Service Boards.

**Deposit.** All students registering for Air Force ROTC will make a deposit of \$25 with the military property custodian as the basis for issue of the prescribed uniform, textbooks, other authorized materials and to cover certain authorized social activities. This deposit, less deductions to defray the above costs, or loss or damage of uniforms or textbooks through personal neglect, will be refunded at the end of each semester by the military property custodian.

**Flight Instruction Program.** All qualified senior students interested in becoming Air Force pilots may participate in the Flight Instruction Program (FIP) during their last year in college. Those who complete this

program, and pass the Federal Aviation Administration (FAA) examinations, may receive their private pilot licenses. Each student receives 36½ flying hours of instruction at an FAA-approved flying school at no expense to the student. This training also includes ground school instruction in weather, navigation and Federal Aviation Regulations.

### Military Science (Army ROTC)

**Purpose.** The Department of Military Science curriculum consists of the Basic Course (freshmen and sophomores) and the Advanced Course (junior and seniors). The goal of this professional education is to prepare selected students with leadership potential to be commissioned officers within the national defense structure of the United States. Specific objectives include providing students an understanding of the nature and operations of the U. S. Army; developing the leadership and managerial potential of the students to facilitate their future performance; developing students' abilities to think creatively, to speak and write effectively; and to provide the student with an appreciation of the requirements for national security. Upon graduating from the University each student who has successfully completed the Advanced Course will receive a commission in the United States Army Reserve.

Appointments as Second Lieutenants in the Regular Army are available to outstanding students who desire a career in the military service.

**General Qualifications.** A student entering Army ROTC must: (1) be a male citizen of the United States (noncitizens may enroll but must obtain citizenship prior to commissioning); (2) be of sound physical condition;

(3) be at least 17 years of age for entrance into the Advanced Course and be able to complete all commissioning requirements prior to age 28. Students with prior active military service or previous high school ROTC may be given credit for all or a part of the Basic Course.

**Qualifications for Admittance to the Advanced Course.** (1) Successful completion of the basic course for the student in the four-year ROTC program. For the student in the two-year program, selection for and successful completion of the six-week basic summer camp. (2) Successfully pass the Officer Qualification Test (RQ Test). (3) Pass the Army physical examination. (4) Have attained a minimum cumulative grade point average of 2.0 ("C") for the first two years of college work and maintain that minimum during the period in which he is a student in the Advanced Course. (5) Be selected by an interview board composed of Army officers.

**Four-Year Program.** The student normally enrolls in Army ROTC during his freshman year. He takes the Basic Course during his first two years, receiving a total of 8 semester hours credit for the four semesters of study. Upon satisfying the requirements stated above, he enters the Advanced Course where he will earn 10 semester hours of credit for the four semesters of study. In addition, he will attend a six-week advanced summer camp at an Army post between his junior and senior years. Upon successful completion of the Advanced Course and requirements for a degree, he is commissioned as a Second Lieutenant in the United States Army Reserve.

**Two-Year Program.** Students must have two academic years of college work remaining,

either at the undergraduate or graduate level, or a combination of the two. This program is designed primarily for the junior college transfer or for the student transferring from a university where the four-year Army ROTC program was not available. Students seeking enrollment in the two-year program must make application during January or February of the year in which they desire to enter the program. They must pass the Army Officer Qualification Test (RQ Test), Army physical examinations and must be selected by an interview board of Army officers. After successfully completing a six-week basic summer camp at an Army post (normally conducted during June and July), the student may enroll in the Advanced Course. He then follows the same program and meets the same requirements as stated for Advanced Course students in the four-year program.

**Pay and Allowances.** Advanced Course students in their junior and senior years receive \$50 per month for the 20 months of enrollment in the Advanced Course. The student also receives one-half the pay of a second lieutenant during his attendance at the six-week advanced summer camp. Uniforms, housing and meals are provided at camp without cost to the student and he is reimbursed at the rate of 6¢ per mile for his travel to and from the camp. Students who enter the two-year program will receive the pay of an Army recruit during attendance at the basic summer camp as well as 6¢ per mile for travel to and from the camp.

**Scholarship Programs.** The Army ROTC offers four scholarship programs for outstanding young men who are motivated toward a career as professional officers in the Regular Army. These scholarships pay for all fees, tuition and books, and provide

\$50 per month subsistence allowance while the scholarship is in effect. A scholarship for four years is available to freshmen who will enter the four-year program. Applications must be submitted during the fall of the senior year in high school and selection is made on a nationwide basis. Scholarships are available for three-, two- and one-year periods commencing with the sophomore, junior and senior year of ROTC, respectively. Applications are open to cadets in good standing in the program and selection is made by an interview board composed of University faculty members and Army officers in the ROTC detachment. Acceptance of any of the four scholarship programs requires service in the active Army for a period of four years after commissioning.

**Deposit.** A \$25 deposit will be required for all students registering for ROTC to cover the issue of the prescribed uniforms, textbooks and other authorized materials. This deposit, less authorized deductions to cover cleaning, laundry or loss or damage to uniforms or textbooks through neglect, will be refunded at the end of the school year.

**Draft Deferment.** Those students enrolled in the Advanced Course are granted deferments from induction by all selective service boards. Draft deferments are available to scholarship students while they are freshmen and sophomores enrolled in the Basic Course.

**Flight Program.** Qualified students interested in becoming Army aviators may participate in the flight program during their last year in college. Those who complete this program and pass the Federal Aviation Administration examinations, will receive a private pilot license. The course includes 36½ flying hours and 35 hours ground school presented

by an FFA-approved flying school at no expense to the student.

**Active Duty Requirements.** Graduates of Army ROTC are required to spend two years on active duty. Scholarship students, students who receive flight training, and those students who desire an Army career and receive a Regular Army commission, have additional amounts of time added to their basic two-year commitment. A delay from call to active duty for up to four years is available to outstanding students who desire to earn a graduate degree.

**Graduate and Professional Studies Programs.** Special programs for graduate and professional studies are available to both Regular Army appointees and U. S. Army Reserve appointees in the following areas: medicine, dentistry, veterinary medicine, osteopathy, religious studies, legal studies, pharmacy or specialized fields of medicine.

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## General Studies

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Arizona State University students are required to demonstrate a satisfactory level of basic knowledge in the humanities and fine arts, social and behavioral sciences, and sciences and mathematics. Specific patterns of general studies requirements are established by the colleges of the University within the overall program approved by the General Studies Council. Since requirements under this program vary somewhat from one curriculum to another, the student should refer to the catalog description of the recommended general studies program in his college. Students from approved institutions

of higher education ordinarily will be given credit, hour for hour, for work done in those institutions insofar as it is equivalent in content to general studies courses at this University.

All students who are candidates for a bachelor's degree are required to complete 36 to 57 semester hours in general studies courses, depending upon the college and curriculum in which they are enrolled. The total number of semester hours required in each of the fields listed below is specified by the individual colleges:

### Humanities and Fine Arts

ARCHITECTURE, ART, DANCE, DRAMA, ENGLISH, FOREIGN LANGUAGES, INTERDISCIPLINARY HUMANITIES, MUSIC, PHILOSOPHY, SPEECH.

A student selects with the approval of his advisor two or more courses which comprise a pattern designed to enhance his ability to develop a discriminating appreciation and understanding of the humanities, fine arts and philosophical ideas. This pattern is intended to develop standards of critical judgment, ability to assess and evaluate humanistic ideas and values, and competence in the basic arts of communication and self-expression.

### Social and Behavioral Sciences

AEROSPACE STUDIES, AGRICULTURE, ANTHROPOLOGY, BUSINESS ADMINISTRATION, CULTURAL GEOGRAPHY, ECONOMICS, EDUCATION (EDUCATIONAL FOUNDATIONS), ENGINEERING, HEALTH EDUCATION, HISTORY, HOME ECONOMICS, MASS COMMUNICATIONS, MILITARY SCIENCE, POLITICAL SCIENCE, PSYCHOLOGY-PX, SOCIOLOGY.

A student selects with the approval of his advisor two or more courses which comprise a pattern of study in the social and behavioral sciences. This pattern should be designed to expand knowledge of the individual and his relation to society; to deepen the historical appreciation of American and other cultures; to estimate the impact of science, technology, and changing business and economic conditions on human societies; and to increase awareness of the major social issues of the time.

### Sciences and Mathematics

BOTANY, CHEMISTRY, ENGINEERING, GEOLOGY, MATHEMATICS, PHYSICAL GEOGRAPHY, PHYSICS, PSYCHOLOGY-PY, ZOOLOGY.

A student selects with the approval of his advisor two or more courses which comprise a coherent pattern designed to explore the fundamental concepts of science and mathematics; to reveal the role of observation and experiment, inductive and deductive reasoning, and the quantitative approach in modern physical, biological and engineering science; and to bring into sharp focus the scientific forces that influence the destiny of man.

To complete the total requirements in general studies, the student shall select with the approval of his advisor appropriate electives from the above fields or from other fields approved within the framework established by each college. Requirements in these fields of general studies may be met by advanced standing credit or may be waived by virtue of acceptable performance on a proficiency examination. In such cases, the prescribed requirements are correspondingly reduced.

### University English Proficiency Requirement

EN 101, 102, First Year English—3, 3 is required of all students. The requirement of EN 101 and 102 may be waived upon demonstration by examination of such proficiency as the English Department may require. Students who pass an exemption examination will register for EN 104, Advanced First Year English—3, instead of EN 101, 102.

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## Honors Program

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**Purpose.** The Honors Program is designed for students of exceptional ability who are interested in scholarly attainment. Through this program, it is hoped to encourage the student to develop an awareness of the inter-relatedness of all knowledge and experience, and to make him more concerned with basic values — intellectual, esthetic, social and ethical. Wide reading, thorough scholarship and independent creative work are emphasized throughout the program.

**Admission.** Students may be admitted to the Honors Program on the basis of their previous academic record, specialized tests and a conference with an examining committee of the Honors Council of the college in which the student is enrolled.

**Description.** Students admitted to the Honors Program will spend a considerable portion of their time in the serious study of the general field of their major and also will do some work in related fields and in general studies. The work includes: (1) general reading and discussion covering the entire major field, emphasizing those areas not

covered by formal courses, plus such work in related fields as may seem desirable; (2) specialized and intensive work in some phase of the major field selected by the student in consultation with his Honors advisor and approved by the department of his major. The student's thesis, or creative project, will be within this field of specialized work.

The program has the same general requirements for graduation as exist within the regular degree programs. In order to stimulate the student to do outstanding work, the advisor, operating under the rules established by the Honors Council in each college, may substitute work on a higher level than that stipulated in the general studies or major requirements but always within the same field.

For specific details of individual College Honors Programs, see the individual college sections of the catalog.

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## Baccalaureate Degree Requirements

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The University grants the following baccalaureate degrees: Bachelor of Arts, Bachelor of Science, Bachelor of Architecture, Bachelor of Science in Engineering, Bachelor of Science in Nursing, Bachelor of Arts in Education, Bachelor of Music, Bachelor of Fine Arts. To obtain a second bachelor's degree, the student must do an additional 30 hours of work or more and meet all requirements of the particular degree.

**UNIT OF CREDIT.** The semester hour is the unit of credit. It represents one 50-minute class exercise per week per semester with two hours of outside preparation.

**CREDIT REQUIREMENTS.** A minimum total of 126 semester hours is required for graduation with a bachelor's degree. Forty percent of the semester hours required for graduation must be in upper division courses numbered 300 or 400.

Credit earned in correspondence courses may be applied toward the bachelor's degree; however, not more than 30 semester hours of credit in correspondence courses and/or by comprehensive examination will be accepted for credit toward the degree. (See section on "Extension Division.")

**MEETING NEW COURSE REQUIREMENTS.** Students whose registration and attendance is continuous may graduate under the curriculum and course requirements or equivalent, and regulations for graduation, as stated in the *General Catalog* for the year the student first registered.

Effective for students enrolling for the first time after September 1, 1965, continuous residence shall be construed to apply or be in effect, provided the student receives credit for at least three semester hours for each semester, for a total of up to eight semesters. If the continuous enrollment extends beyond eight semesters, the credit received for each must not be fewer than three for each semester and must average six semester hours of credit received for the next eight semesters. Continuous residence will not apply for any degree program beyond 16 semesters and the student will then be required to meet the graduation requirements of the catalog in effect at the time of graduation. Summer Sessions enrollment does not affect continuous residence interpretations.

When registration and attendance is not continuous, the student will be required to meet the curriculum and course requirements and regulations for graduation as stated in the catalog for the year the student registers

for final continuous residence prior to graduation.

**PHYSICAL EDUCATION.** Although physical education is not required for graduation, the Department of Health, Physical Education and Recreation provides an opportunity for students to enroll for elective credit in physical activity courses.

**SCHOLARSHIP REQUIREMENTS.** In order that a student may be eligible for graduation, his cumulative scholarship index must be 2.00 or better for all work taken while a student at this University.

**GRADUATION WITH DISTINCTION.** Students who have a cumulative scholarship index of 3.00 through 3.49 will be graduated *with distinction*. Students who have a cumulative scholarship index of 3.50 through 4.00 will be graduated *with high distinction*. Students to qualify for graduation with these designations must have completed at least 60 semester hours in residence at Arizona State University and all transfer credits must be at least of equal academic quality.

**GRADUATION WITH HONORS.** Students in the Honors Program who have a cumulative scholarship index between 3.25 and 3.49 and are approved for scholarly achievement by the Honors Council will graduate *cum laude*. Those in the index range of 3.50 to 3.74 will graduate *magna cum laude*. Those in the index range of 3.75 to 4.00 will graduate *summa cum laude*.

**RESIDENCE REQUIREMENTS.** A minimum of one year residence as a regular student is required of every candidate for the bachelor's degree, and the final 12 semester hours immediately preceding graduation must be taken in residence. For purpose of record, a year in residence is defined as 30 semester hours of credit earned either in on-campus courses or in established residence centers of

Arizona State University. It has no reference to living in residence halls or in Tempe.

Credit earned in correspondence courses cannot be used to meet residence requirements. The 12 semester hours of final residence may be taken during a semester of the regular academic year or during the summer terms. Exception to the final 12 semester hour regulation may be made by the standards committee of the college in which the student is enrolled. Petitions for an exception must be made in writing and addressed to the dean of the college in which the student is enrolled.

**APPLICATION FOR GRADUATION AND TEACHING CERTIFICATES.** Students who plan to complete requirements for graduation at the end of either summer term or the first semester should pay the application for graduation fee and file their Application for Graduation

with the Registrar and Director of Admissions before registering for their final term or semester. Those planning to complete degree requirements during the first semester must file an Application for Graduation prior to April 1 of the preceding academic year. Those planning to complete requirements for graduation in June should pay the application for graduation fee and file their Application for Graduation with the Registrar and Director of Admissions before November 15. A \$5.00 late fee is charged students planning to graduate in June who do not file the Application for Graduation by the November 15 deadline. The filing of late applications for June commencement extends from November 16 to the last day of late registration for second semester. Students cannot change their application from one degree to another after the beginning

of the final semester's work.

Application blanks are obtained in the Office of the Registrar and Director of Admissions. Candidates who fail to pay the application for graduation fee and file applications at the time specified are required to pay the late fee and may be scheduled for graduation at a later date. Upon filing an Application for Graduation, a final check on graduation requirements is made by the Office of the Registrar and Director of Admissions. A check sheet showing the remaining requirements for graduation under the curriculum designated in the application is furnished the student as a guide to his final semester's registration.

Applications for teaching certificates should be obtained from the office of the Coordinator of Advisement in the College of Education.

**FINANCIAL CLEARANCE.** Before a student may receive his diploma or any transcript, he must obtain financial clearance at the Business Office. Financial clearance indicates that the regular fees, library, housing charges, dining hall, parking sanctions and other fees have been paid.

**ADVANCED DEGREES.** The University grants the following advanced degrees: Master of Arts, Master of Science, Master of Arts in Education, Master of Business Administration, Master of Science in Engineering, Master of Fine Arts, Master of Natural Sciences, Master of Public Administration, Master of Music, Master of Social Work, Master of Counseling, Education Specialist, Doctor of Philosophy, Doctor of Education, Doctor of Business Administration and Juris Doctor.

See section of the catalog headed "Graduate College" for statements of requirements for these degrees (page 249).



# Student Services, Organizations and Activities

GEORGE F. HAMM, PH.D.  
*Vice President, Student Affairs  
Dean of Students*

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## University Counseling and Testing Services

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Arizona State University offers an advisement, counseling and testing program designed to assist the student to develop an educational program relevant to his individual needs and aspirations. Elements of the program include orientation, counseling, testing, curriculum advisement and diagnostic services.

**Orientation.** An orientation program is provided for new students. It includes placement testing, health examinations, social events and review of university curriculums and services.

**Personal and Program Guidance.** Personal counseling is available to individual students in the Office of Student Affairs. In addition to individual counseling, the personnel deans have responsibility for guidance and direction of the out-of-class programs of orientation, honor societies, activities, fraternities and sororities, residence hall living and student government.

**Student Counseling Service.** A staff of counseling psychologists, clinical psychologists and social workers are available for confidential interviews. Appointments may be made to discuss such personal-social adjustment, understanding of self and evaluation of long-term goals. Increased self-understanding often permits the student to make more effective use of his intellectual and personal resources.

Counseling does not involve telling the student what to do; the student makes the decisions. Thus, emphasis is placed on the ultimate responsibility of each individual

for conducting his own life and making the most of it.

Group counseling is also available which allows the student the opportunity to explore and share his problems with other students.

The Student Counseling Service does not offer course or program advisement. This is a service offered by faculty academic advisors (see Curriculum Advisement below).

**The University Testing Service.** Located in Payne Hall, the University Testing Services supports the academic programs of the University by administering and scoring tests which may be required for students for admission to and placement in various academic programs. In this connection, it carries out research studies requested by various colleges and departments of the University for the purpose of providing data on the basis of which informed decisions can be made.

A scoring service is provided to those faculty who are able to use machine-scorable exams in their classrooms. This service includes providing consulting help in the construction of exams, scoring the exams, preparing rosters for reporting scores to the students, and calculating data by which the adequacy of the examination may be judged.

As a convenience to students and local Arizona residents, the University Testing Services also serves as a center for the administration of tests given on a national basis for qualification in various professions and for admissions to other colleges and universities as well as professional schools throughout the country.

**Curriculum Advisement.** Every student needs a plan of study by which he pursues his main objectives in collegiate education. This plan of study is his curriculum. Entering students frequently need advice and assistance in deciding upon their curriculums.

Arizona State University attempts to meet this need by providing opportunities for each student to consult with an academic advisor and to select an academic area which seems to meet the professional interests and abilities of the student. The student may keep this curriculum and major field, and may continue to discuss his academic plans with the same advisor throughout his college career; or he may change to another major field and advisor in the future.

**Speech and Hearing Clinic.** The Speech and Hearing Clinic, located in the Language and Literature Building, provides the opportunity for students to gain practical experience working with children and adults handicapped by speech or hearing disorders, and in giving examinations and therapy for those who need help. The service is available to University students, the public schools, educational and medical agencies, and individuals in the community.

**Honors Advisors.** Honors advisors are available in the departments of each of the colleges offering the Honors Program.

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## Housing

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Despite differences in location, age, physical facilities and environment, all residence halls make a very real contribution to the educational program at Arizona State University. The primary objective of the residence hall program is to provide an atmosphere conducive to exploration, study and challenge in terms of the student's potential. It emphasizes intellectual, cultural and social development.

In order to provide a variety of possible living experiences, there are freshmen,

upperclass, graduate and all-class halls. McClintock is an honor hall for upperclass women with special requirements for residency. Mariposa hall is for graduate students only. Each hall provides mail service, basic library, resource facilities and desk services. In some halls cafeteria facilities are available. Telephones are provided in all student rooms.

**Reservations.** Application materials obtained from the Housing Office will include forms to be completed by prospective students desiring living quarters in University Residence Halls. The housing application includes a Housing Agreement form and Room Reservation card.

Housing applicants must forward the completed Hall Reservation card and Housing Agreement form together with room deposit to the Housing Office. Although room reservations are contingent upon the applicant being cleared for admission to the University by the Admissions Office, prospective students are urged to file their applications for housing *before* being admitted to the University.

Preferences of residence halls may be stated at the time of making reservations. Assignments to halls are made by the Housing Office in accordance with policies established by the University. Assignments to the honor hall for women are made through the Office of Student Affairs. Room assignments are made by the Unit Manager.

Residence in halls, sorority or fraternity houses is restricted to students registered for 12 or more units of regular work. Any exception must be approved by the Office of Student Affairs. The University reserves the right to change the residence of any student or to deny or cancel residence accommodations of students in any cases where such action is deemed desirable.

**Residence Hall Regulations.** Rules and regulations, other than those set forth in the University *Code of Conduct*, may be formulated by the Office of Student Affairs. Individual halls may formulate additional regulations for their respective situations.

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## Health Service

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**Student Health Service.** This service is staffed by physicians and registered nurses.

A completed physical examination, within 12 months prior to registration by a practicing physician and recorded on the Report of Medical History and Medical Examination form, is a part of the admission requirement for all new students.

Also required is a tuberculin skin test of all new students. If there is a past history of a positive skin test, then a chest film will replace the tuberculin test. This will be done at the Health Service prior to registration and during Orientation Week at no expense to the student. The above can also be obtained on announced summer dates for early registration.

Former students who have not been in attendance at the University for two years or more will meet the same requirements as new students.

**Student Health Service Treatment.** Dispensary services are available during regularly posted hours, and at any hour for emergencies, to all students. No illness will be cared for in the residence halls, nor will any prescription be made for a student not reporting in person to the Health Service. Bedside care will be given in the infirmary for one week per semester without charge. A very nominal charge is made after that time

should further care be needed. Students who do not have meal tickets at one of the University dining halls will pay for meals served while in the infirmary. There is no limitation on the number of clinic visits. Contagious illness will be cared for in the Health Service whenever possible, but diseases requiring long periods of isolation must be treated either at home or in a local hospital at the student's expense.

**Illness or Injury Must Be Reported.** Any illness or injury should be reported to the Student Health Service without delay. A campus resident is required to report illness immediately to the head resident of his or her hall. Failure to do so may result in one being asked to leave the hall. Health reports are sent to the family physician upon request of the student. Parents will be notified at once of any serious illness or need for hospitalization; however, they are not routinely notified of all admissions to the Health Service.

**Financial Responsibilities.** With the payment of the General University Fee each semester, all regularly registered students are entitled to Student Health Service care according to established policies. Students may be referred to consultant specialists when the University physicians consider it advisable, but such fees must be borne by the student. When hospitalization is considered necessary, the University assumes no financial responsibility. Parents are consulted in advance of hospitalization if at all possible.

**Student Insurance.** Insurance policies are available through Associated Students which help defray the cost of accidents or any necessary hospitalization. Students are expected to take advantage of these plans which supplement the Student Health Ser-

vice. Insurance coverage is mandatory for international students. Graduate and undergraduate students enrolled for 7 or more semester hours are eligible for the two programs offered: (1) Accident and Sickness Insurance — covers 24 hours a day, around the world, September to September. (2) Life Insurance — \$10,000 coverage for one year from the date of issue.

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## Career Services

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The office of Career Services is maintained to assist undergraduates, graduates and alumni in obtaining employment according to their training, ability and experience, and is dedicated to the furtherance of equal employment opportunities. It is the purpose of the office to serve the state, region and nation by providing adequately trained personnel for business, industry, government and education. Although the office of Career Service does not guarantee placement, every effort is made to aid students and those in the field who desire assistance. Candidates for employment may register by filling out the appropriate forms. Upon registering, candidates receive full information and instructions relative to securing employment.

**Student Part-time and Summer Division.** Career Services aids students attending the University in securing part-time and summer employment, both on and off the campus, which tends to supplement their income and educational goals.

**Educational Division.** Career Services assists graduating students and alumni in obtaining teaching and administrative positions in elementary schools, secondary schools, and in institutions of higher education. It seeks,

at the same time, to serve the best interests of these institutions by referring candidates adapted to their particular needs.

**Commercial Division.** Career Services serves graduating students and alumni who are interested in commercial, industrial and governmental placement. Efforts are made to place students in their chosen fields, and at the same time, aid employers to obtain properly trained personnel.

All correspondence should be addressed to the appropriate division in the office of Career Services.

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## Alumni Association

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The Alumni Association is one of the University's oldest organizations, dating back to 1894. In addition to retaining communications with all alumni, the Association also raises money in support of the University, recruits high school scholars, assists student and faculty organizations and aids with various University or community projects.

**Membership.** Approximately 52,000 graduates, including the class of 1971, retain membership in the Alumni Association. All students become active members upon graduation and associate membership may also be given to those students who have attended the University at least one semester.

**Alumni House.** The campus center for alumni of the University is Alumni House, situated just east of Old Main. Formerly the president's home, it now houses the offices of the Association's executive director, assistant director, editor of alumni publications, and alumni records offices, as well as reception and meeting areas for alumni and various organizations.

**Alumni Fund.** During the past decade, nearly a half million dollars has been contributed to the University through individual alumni gifts. This figure is expected to be tripled during the 70's. Each year, ASU alumni provide books for the library, scholarships and loans for deserving students, financial aid in recruiting outstanding faculty, textbooks for disadvantaged students, funds for individual colleges within the University, and help in many other areas.

**John R. Sandige Endowment Fund.** More than \$60,000 has been contributed to the Sandige Endowment Fund over the years. Earnings from this Fund are transferred periodically to the ASU Alumni Loan Fund for needy students. These earnings, coupled with contributions from the Alumni Fund, have helped over 5,000 ASU students gain their education during recent years.

**Alumni Publications.** The Association's official publication, the *Arizona Statesman*, is published bi-monthly in newspaper form with a magazine published annually in July for all members. Present circulation is approximately 48,000.

**Alumni Awards.** The Association annually presents two awards, the Distinguished Teacher Award and the Faculty Achievement Award, in recognition of distinguished teaching and professional achievement. Presented annually at Homecoming is the Alumni Appreciation Award to an individual (not an alumnus) who has served the University, and the Alumni Service Award to an alumnus who has served and aided the University. A Medallion of Merit Award is presented each year to an outstanding junior in each of Arizona's high schools.

**Alumni on Campus.** Each student at the University is considered by the Alumni

Association as "an alumnus in residence" and as such, the executive director and his staff aid and cooperate fully with students and student organizations.

The Association includes two student voting members on its Board of Directors and sponsors a student organization, the Devil's Advocates, consisting of 35 of the University's outstanding students. The Devil's Advocates aid in recruiting outstanding scholars through speaking engagements at high schools, special events and tours of campus for these prospective University scholars.

Students and alumni are encouraged to visit Alumni House.

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## Scholarships, Fellowships and Loans

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### Arizona State University Scholarships

**Regents' Scholarships.** The Board of Regents has created a number of scholarships, which are awarded annually by Arizona State University to new and currently-enrolled students who meet the qualifications established by the Regents. The financial need of applicants is one of the factors considered in selecting recipients of these scholarships. Deposits are waived for all students awarded those Regents' scholarships which provide for the remission of fees (including nonresident tuition, if applicable).

**Academic Scholarships.** These scholarships are available to students who give promise of high scholastic achievement. They provide for the remission of the general University fee and, in the case of out-of-state students, nonresident tuition. A significant number of

these scholarships are designated for qualified minority students.

**Reservation Indian Scholarships.** Two four-year scholarships are awarded annually to Arizona reservation Indians who have demonstrated ability in the fields of scholarship and leadership. These scholarships cover the general University fee for four years.

**Foreign Student Scholarships.** Graduate and undergraduate scholarships are available to qualified students from foreign countries who have previous satisfactory scholastic records and show promise of achievement in promoting good international relations. These scholarships cover regular registration and class fees and nonresident tuition. The ability to read and speak the English language is required.

**Activity Scholarships.** These scholarships are available to new and currently-enrolled students who give promise of satisfactory scholastic achievement, of outstanding success for skills or talent in the institution's program of approved activities, and of developing desirable qualities of character and leadership. Freshmen must have graduated in the upper two-thirds of their high school classes in order to be considered for these scholarships. The scholarships listed immediately below make up the category, "Activity Scholarships." Although the promise of superior performance in extra-curricular activities is one of the factors considered in awarding these scholarships, the recipients must, nevertheless, have met the fundamental requirements of academic ability.

**Athletic Scholarships.** These scholarships provide for the remission of the general University fee and, in the case of out-of-state students, nonresident tuition. In addition,



recipients of these scholarships may qualify for room and board awards under the Sun Angel Scholarship Fund and also for loan of books under the Sun Devil Book Loan Fund.

*Band Scholarships.* These scholarships provide for the remission of the general University fee and, in the case of out-of-state students, nonresident tuition. A limited number also provide for the remission of fees for private music lessons.

*Choral Scholarships.* These scholarships provide for the remission of the general University fee and, in the case of out-of-state students, nonresident tuition.

*Orchestra Scholarships.* These scholarships provide for the remission of the general University fee and, in the case of out-of-state students, nonresident tuition. In addition, they may provide for the remission of fees for private music lessons.

*Voice and Piano Scholarships.* These scholarships provide for the remission of the general University fee. They also provide for the remission of nonresident tuition where applicable.

All the Arizona State University Scholarships listed above may be renewed annually upon re-application by the student and approval by the Scholarship Committee.

**Sponsored Scholarships.** In addition to the Arizona State University Scholarships described above, several hundred scholarships are offered through the University which are sponsored through private or public sources.

**Federal Programs.** Arizona State University participates in the following federal programs: National Defense Student Loans, Nurses Training Act Loans, Law Enforcement Loans, Educational Opportunity Grants, Nursing Scholarships (grants), Law Enforcement Grants and the College Work-Study program. For complete information concerning these programs, see a special brochure available from the Financial Aids Office.

**University Loan Funds.** Short-term loans are available for students enrolled in the University in a full-time program to meet the needs of any reasonable educational expense. The extent of this financial need must be established.

Loans are not available for any non-educational expense which is normally financed by a commercial lending institution, nor are they available for the repayment of any previously incurred indebtedness.

The maximum loan limit shall be determined by a number of considerations. One

of primary importance is the ability to repay. Generally, undergraduate students may borrow in modest amounts repayable within the academic year or before the beginning of the next school year. For graduate students, such factors as degree program and professional objectives shall be taken into account in determining the extent of credit and repayment schedule. Most University loans carry a nominal rate of interest or a small service charge. Applications may be filed at any time during the school year. A special brochure providing additional information on loans is available from the Financial Aids Office.

The Financial Aids Office notifies students by a special ASU Award Form of any federal funds or Regents academic scholarship allotted to them. This award form does not imply admission to the University, which is granted only through the Admissions Office.

Funds become available to the student only if the federal government has allocated sufficient funds to the University to cover the award, if the student is admitted to the University, and if he has finished registration except for the payment of fees.

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## Honors and Awards

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Requirements are listed after award or honor title.  
Areas of interest having more than two awards are listed by subject matter.

### Scholastic Achievement Awards

*Moeur Award.* Given by Annie Lassator Moeur, graduate of the Class of 1914, and the Alumni Association, this award is presented to the graduate of any four-year curriculum who attains the highest standing in academic work during the four years immediately preceding graduation.

*American Association of University Women.* Arizona State Division and Phoenix and Tempe Branches: Senior women.

*Arizona Historical Foundation Award.* Senior.

*Art Purchase Prizes and Awards.* Four Divisions.

*ASASU Academic Achievement Award.* Senior.

*Associated Women Students' Outstanding Senior Woman Award.*

*Albert P. Ball Memorial Award.* Essay on Psychology.

*Chi Omega Social Science Award.* Women, Sociology and Anthropology

*College of Nursing Achievement Award.* Senior.

*Thomas J. Croaff Award.* Senior, research paper in Political Science.  
*Freshman Art Award.*

*La Liga Panamericana Award.* Senior, service to club and Spanish proficiency.

*Man of the Year Award.* Senior.

*Phi Eta Sigma Award.* Man, sophomore.

*Phi Kappa Phi Award.* Junior.

*Pi Kappa Delta Awards.* National forensic honorary; Order of the Brown Cow; Man and Woman Debaters of the Year.

*Women's Physical Education Award.* Senior.

ARCHITECTURE: *American Institute of Architects Awards; American Institute of Architects School Medal,* Senior; *Weaver and Drover Prize for Architectural Design.*

BUSINESS ADMINISTRATION: *Arizona Society of Certified Public Accountants' Award; Delta Sigma Pi Scholarship Key,* Senior; *National Business Education Award of Merit; Pi Omega Pi Award; Society for Advancement of Management Outstanding Student Award; Valley of the Sun Chapter, NSA, Ellerie C. Becker Scholarship Award.*

CHEMISTRY: *American Institute of Chemists Award,* Senior; *Chemical Rubber Publishing Company Awards in Chemistry and Physics,* Freshmen; *Merck Index Award,* Senior; *American Chemical Society Division of Analytical Chemistry Award,* Junior; *Monsanto Award,* Senior.

EDUCATION: *Association for Childhood Education, Student Branch Award; Kappa Delta Pi Award,* Junior; *Kappa Delta Pi Scholarship Key,* Senior; *Student National Education Association Award* (ASU Chapter).

ENGINEERING: *American Institute of Chemical Engineers Scholarship Award,* KE Junior; *Associated General Contractors: Outstanding Senior in Construction; Eta Kappa Nu Outstanding Electrical Engineering Student Award,* Senior; *Gerald F. Jensen Construction Service Award: Student of the Year – Service to Others in His Major; Institute of Electrical and Electronic Engineers Prize Paper Awards* (Arizona Section); *Lewis S. Neeb Award,* Senior, industrial education; *Tau Beta Pi Essay Award,* Engineering honorary pledge.

HOME ECONOMICS: *Beta Chi Award,* Senior Woman; *Mary Essig Award,* Senior, home management; *Home Economics Senior and Sophomore Awards; Phi Upsilon Omicron Freshman Award.*

HUMANITIES: *Ernest L. Parker Humanities Award; Humanities Honor Award to Outstanding Senior; Humanities Honor Award to Outstanding Graduate Student.*

MASS COMMUNICATIONS: *W. A. Krueger Company-Tyler Division Award; McGrew Printing Journalism Award; Mesa Tribune Award; Sigma Delta Chi Outstanding Male Graduate Award; Tempe Daily News Journalism Award.*

MUSIC: *Harry B. Harelson Award,* Outstanding Sophomore or Junior Vocal Major; *Kappa Kappa Psi Award, Beta Omicron Chapter, band; Man of Music Award* (Kappa Nu Chapter of Phi Mu Alpha); *Ralph H. Morris Instrumental Music Award, Sigma Alpha Iota, Gamma Mu Chapter, Phoenix Alumnae Awards,* best musical performer of pledge class, chapter member with high scholastic ability and musical performance, Patroness Scholarship, Dean's honor award to a senior; *Tau Beta Sigma Award,* University Band member.

**RESIDENCE HALLS:** *M. O. Best B Hall Award; Hayden Hall Scholarships; Interhall Council Award; Mortar Board Outstanding Hall Scholarship Award; Quadrangle Unit Award.*

**RELIGION:** *Hillel Honor Awards; John Henry Newman Awards; Newman Catholic Students Association Service Award, Senior woman; Religious Activities Awards, man and woman; Student Inter-faith Council Awards.*

**SORORITIES — PANHELLENIC:** *Outstanding Pledge Award; Scholarship Cup; Scholarship Plaque; Woman of the Year, Junior or Senior.*

**WRITING:** *Glendon and Kathryn Swarthout Prizes in Creative Writing, first and second prizes in poetry and fiction to two undergraduate and two graduate students.*

### **Athletic Awards**

*Blue Key Award.* (Baseball, outstanding player)

*Charles Christopher Memorial Award.* (Trophy, general athletic and scholastic ability, freshman)

*Bob Gehres Blue Key Award.* (Baseball, most valuable player)

*Glen Hawkins Sportsmanship Award.* (Football)

*Interhall Council Award.* (Intramurals, presented to residence hall)

*Most Valuable Player Award.* (Basketball, trophy)

*Old Timers Award.* (Outstanding letterman)

*Rosenzweig Trophy.* (Outstanding letterman)

### **Reserve Officer Training Corps Awards** (Military Science and Aerospace Studies)

*Academic Vice President's Awards.* (Decoration to senior year Squadron and Company Commanders)

*Aerospace Education Foundation W. Randolph Lovelace Memorial Award.* (Outstanding Air Force Association Award Winner)

*Air Command and Staff College Award.* (The most outstanding AFROTC cadet in the nation)

*Air Force Association Award.* (Outstanding Aerospace Studies Senior Cadet)

*Air Force Times Award.* (Cadet to bring outstanding constructive attention to AFROTC)

*Air National Guard Award.* (Trophy to outstanding cadet fulfilling six requirements)

*American Fighter Aces Association Award.* (Outstanding category IP (Pilot) Graduating Cadet)

*Angel Service Award.* (Angel Flight member contributing most to service projects)

*Arizona National Guard Award.* (Trophy)

*Armed Forces Communications and Electronic Association Award.* (Medals to the outstanding Army and Air Force ROTC senior cadets)

*Arnold Air Society Award.* (AFROTC Cadet, second-year course)

*Association of the United States Army Medal.* (First-year advanced course cadet, Army ROTC)

*Association of the United States Army Military History Award.* (Sophomore Army ROTC cadet achieving highest grade in semester military history is studied)

*Commandant's Marksmanship Award.* (Top marksman on Army ROTC Rifle Team)

*Daughters of the American Revolution Award.* (Outstanding AFROTC senior cadet)

*Dean of the College of Liberal Arts Awards.* (Decorations to junior year platoon officer and flight commander)

*Dean of Students ROTC Awards.* (Decoration for leadership, Army and Air Force cadets)

*Distinguished AFROTC Cadet Badge.* (Distinguished AFROTC cadets)

*General Dynamics Award.* (Model aircraft to second-year basic AFROTC cadet accepted for advanced study)

*Governor's Medal.* (Commanders of Army and Air Force Corps of Cadets)

*Legion of Valor Bronze Cross of Achievement Award.* (Outstanding cadet to achieve excellence in both military and academic subjects)

*Military Order of World War Medals.* (Outstanding records by Army and Air Force cadets in summer training period)

*National Defense Transportation Association Award.* (Outstanding AFROTC Senior Cadet majoring in Air or Surface Transportation)

*Outstanding Angel Award.* (Member of Angel Flight AFROTC Auxiliary, contributing most to goals of the organization)

*Outstanding Kaydette Award.* (Member of Kaydettes, Army ROTC women's auxiliary, contributing most to furthering ideals and goals of organization)

*Pershing Rifles Award.* (Outstanding ROTC cadet member)

*President's Awards.* (Decorations to two outstanding cadets of second-year advanced course in Army and Air Force Cadet Corps)

*Reserve Officer's Association Medals.* (Medals and certificates to Army and Air Force cadets showing leadership promotion potential and an "A" average in ROTC subjects)

*ROTC Awards.* (For greatest personal contribution to Army and Air Force ROTC programs at ASU)

*Society of American Military Engineers ROTC Award.* (Outstanding AFROTC cadets in last and next to last year of engineering study)

*Sons of American Revolution Award.* (Two cadets of second-year basic courses in Army and Air Force ROTC having highest academic and military class standing, service to department and ASU)

*Superior Cadet Ribbons.* (Department of Army Award to one Army ROTC cadet in each academic class)

*Veterans of Foreign Wars Medals* (Bob Finch Post Number 3632, to two cadets in first-year basic course of both Air Force and Army ROTC)

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## Associated Students

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Every student registering for more than six hours is automatically a member of the Associated Students of Arizona State University. The purpose of ASASU is to promote the educational values of student life. These objectives are accomplished by a structure of student representation designed to express student views and consider their needs. In addition, emphasis is placed upon unity of purpose among students, faculty and administration. Women students are also members of Associated Women Students, which recommends policy relating to women's activities and organizations.

## Organizations

**Student Organizations.** See Organization Directory. Further information may be obtained from the Office of Student Affairs.

In order to be eligible for membership in any student organization, a student must be in good academic standing, and to run for office must have a minimum cumulative GPA (Grade Point Average) of 2.00.

## Councils

### *For Men*

Interfraternity Council (See Sororities and Fraternities)

### *For Women*

Junior Panhellenic Council (See Sororities and Fraternities)

Panhellenic Council (See Sororities and Fraternities)

### *For Both Men and Women*

Business Administration Student Council

College of Architecture Student Body

College of Education Student Advisory Council

Council-Student Bar Association

Engineering College Council

Nursing College Council

Residence Hall Association (See Residence Halls, Sororities and Fraternities)

Student Advisory Council, College of Liberal Arts

Student Inter-Faith Council (See Religious Groups)

## Scholastic Honorary Groups

### *For Men*

Chemistry Society, Honorary

Phi Eta Sigma (National scholastic honorary for freshman men)

Tau Beta Pi Association, Beta of Arizona Chapter (Engineering honor society)

### *For Women*

Alpha Lambda Delta (National scholastic honorary for freshman women)

Alpha Pi Epsilon (National secretarial honor organization)

Mortar Board (Senior women's honorary)

Phi Upsilon Omicron (Home economics)  
Pi Lambda Theta—Beta Kappa Chapter (Honor and professional association for women in education)

*For Both Men and Women*

Alpha Epsilon Delta (National pre-medical honorary)  
Alpha Kappa Delta (Sociology)  
Alpha Mu Gamma (Foreign Language)  
Beta Beta Beta (National biological society)  
Beta Gamma Sigma, Beta of Arizona (National honor society for junior and senior students in the College of Business Administration)  
Delta Pi Epsilon—Alpha Sigma Chapter (National honorary graduate fraternity in business education)  
Delta Tau Kappa—Alpha Sigma (International social science honor society)  
Eta Kappa Nu—Epsilon Beta Chapter (National electrical honor society)  
Kappa Delta Pi—Beta Phi Chapter (National honor society in education)  
Mu Kappa Tau (Marketing)  
National Slavic Honor Society—Epsilon Epsilon Chapter  
Omicron Delta Epsilon Honor Society in Economics—Arizona Alpha Chapter  
Phi Kappa Phi (National honorary scholastic society)  
Pi Mu Epsilon—Arizona Beta Chapter (Mathematics honorary)  
Pi Omega Pi—Alpha Iota Chapter (National business education honorary)  
Psi Chi National Honor Society in Psychology  
Sigma Iota Epsilon—Pi Chapter (Business management)  
Sigma Tau Delta (Honorary English fraternity)

**Honorary Groups**

*For Men*

Archons (Fraternity leadership and service)  
Blue Key Fraternity (National honorary service)

Delta Phi Kappa Honorary Fraternity (L.D.S. returned missionaries)  
Kappa Kappa Psi National Band Honorary Fraternity  
Pershing Rifles, Company D, Tenth Regiment (National professional honorary for ROTC cadets)  
Phi Mu Alpha Sinfonia  
Pi Tau Sigma—Sigma Gamma Chapter (Electrical engineering)  
Sophos (Sophomore men's service)

*For Women*

Angel Flight, Tex May Squadron (Auxiliary to the Squadron of the Arnold Air Society)  
Arkesis (Fraternity leadership and service)  
Kaydettes (Sponsors for the Army Reserve Officers Training Corps)  
Manzanita Hostesses  
Naiads (Swim honorary)  
Natani (Junior women's honorary)  
Sigma Alpha Iota (Women's national music fraternity)  
Spurs (Honorary service organization)  
Tau Beta Sigma (National band sorority)  
Women's "A" Club (Honorary association in sports)

*For Both Men and Women*

Alpha Pi Mu (Industrial engineering honor society)  
Beta Alpha Psi — Beta Tau Chapter (Accounting honorary fraternity)  
Devil's Advocates  
Phi Alpha Theta (National history honorary)  
Pi Kappa Delta (Forensic fraternity)  
Pi Sigma Alpha (National political science honorary)  
Sigma Alpha Eta (Speech pathology)  
Sigma Delta Pi (Spanish)  
Sigma Gamma Epsilon — Beta Chi Chapter (Earth science)  
Sigma Lambda Chi—Eta Chapter (Building construction)  
Silver Wing (Organization of the Air Force Reserve Officers Training Corps)  
University Dance Theatre (Dance honorary)

**Professional and Academic Groups**

*For Men*

Alpha Delta Sigma (National advertising honorary fraternity)  
 Delta Sigma Pi, Gamma Omega Chapter (Business professional fraternity)  
 Phi Delta Kappa (Professional education fraternity)  
 Phi Epsilon Kappa–Alpha Phi (Men’s physical education fraternity)  
 Pi Sigma Epsilon (National professional fraternity in marketing, sales management and selling)  
 Sigma Delta Chi (National professional journalism fraternity)

*For Women*

Gamma Alpha Chi (National professional advertising fraternity)  
 Phi Chi Theta–Gamma Gamma Chapter (Business education and training)  
 Press Women  
 Women’s Physical Education Majors and Minors Club (PEMM)

*For Both Men and Women*

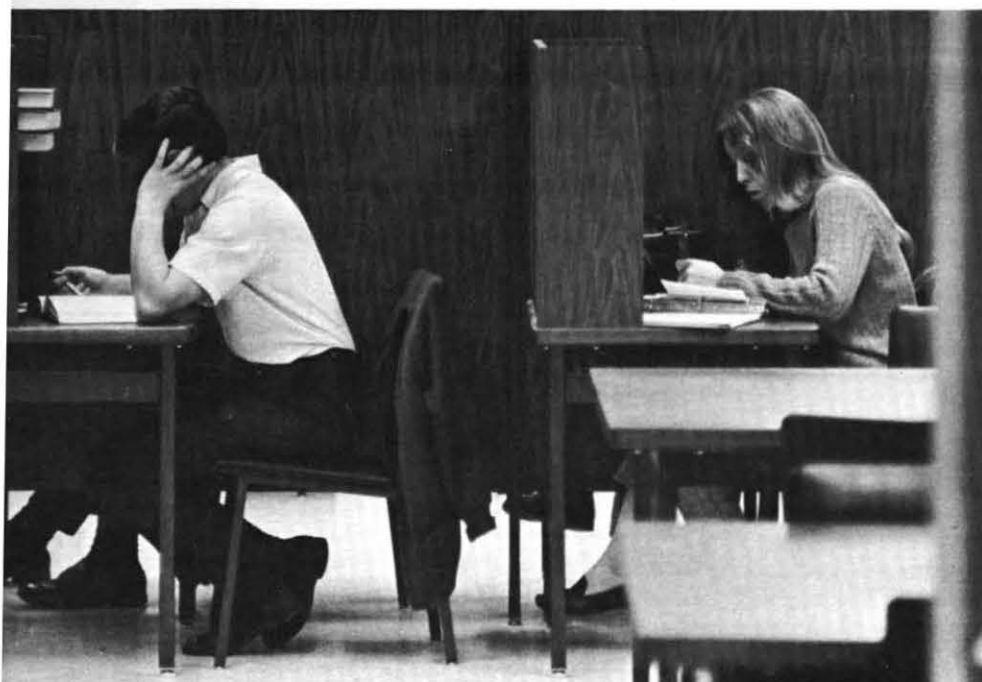
Accounting Association  
 Association of Graduate Business Students  
 Association of Graduate Students in Educational Administration and Supervision  
 Alpha Beta Alpha (Librarian brotherhood)  
 Alpha Eta Rho (Aviation fraternity)  
 American Chemical Society, Student Affiliates  
 Arnold Air Society (National honorary Air Force fraternity for advanced cadets)  
 American Institute of Aeronautics and Astronautics, Inc., Student Branch  
 American Institute of Chemical Engineers, Student Chapter  
 American Institute of Industrial Engineers, Student Chapter  
 American Society of Civil Engineers, Student Chapter  
 American Society of Mechanical Engineers  
 American Society of Tool and Manufacturing Engineers, Student Chapter

Arizona Association of Student Nurses – District No. 5  
 Arizona Home Economics Association, Student Member Section  
 Associated General Contractors, Student Chapter  
 Association for Childhood Education International  
 Economics Club  
 Gamma Theta Upsilon–Theta Chapter (National honorary professional geographic fraternity)  
 Industrial Arts Association  
 Institute of Electrical and Electronic Engineers  
 Music Educators National Conference, Student Chapter  
 National Society of Interior Designers, Student Chapter  
 National Art Education Association, Student Chapter  
 Phi Delta Delta Colony of Phi Delta Phi Law Fraternity  
 Professional Graduate Engineers  
 Prospective English Teachers of Arizona  
 Society for the Advancement of Management  
 Society of Automotive Engineers, Student Group  
 Society of Physics Students  
 Student Association of Social Workers  
 Student Bar Association  
 Student Chapter of the Association for Computing Machinery  
 Student Council for Exceptional Children  
 Student Legal Services Association  
 Student Marketing Club  
 Student National Education Association  
 Student Society of Medical Technology  
 Undergraduate Social Service Organization  
 Wildlife Society, Student Chapter

**Special Interest Groups**

*For Men*

“A” Club (Varsity athletes)  
 Army ROTC Drill Team  
 Army ROTC Rifle Team



Circle K Club (Service club)  
 Desert Rangers (Army ROTC Counterinsurgency Unit)  
 Semper Fidelis Society, Beta Epsilon Chapter (United States Marine Corps)  
 Soccer Club

*For Women*

Association for Women's Active Return to Education  
 Court of Honor (Auxiliary to Sigma Nu)  
 Crescents (Auxiliary to Lambda Chi Alpha)  
 Golden Hearts of Sigma Phi Epsilon  
 K-Mates (Service club)  
 Lionettes (Auxiliary to Alpha Epsilon Pi)  
 Little Sisters of Minerva (Auxiliary to Sigma Alpha Epsilon)

Maltesians (Auxiliary to Alpha Tau Omega)  
 Memorial Union Criadas  
 Memorial Union Hostesses  
 Par Busters (Women's golf)  
 Phrateres International (National off-campus women's group)  
 Pikettes of Pi Kappa Alpha  
 Racquet Club (Tennis)  
 Sisters of the Shield (Auxiliary to Theta Delta Chi)  
 Stardusters of Kappa Sigma Fraternity  
 Wives-In-Law  
 Women's Gymnastic Club  
 Women's Liberation Front

*For Both Men and Women*

African Student Club  
 American Students for Israel  
 Anthropology Club  
 Arab Students, Organization of  
 Black Cultural Center  
 Black Liberation Organizational Committee  
 Civil Liberties Union  
 Committee for Preservation of Exceptional Professors  
 Dawa-Chindi American Indian Club  
 Deutscher Klub (German)  
 Earth People's Park Assistance Organization  
 Environmental Teach-In Committee  
 Feather Dusters (Badminton)  
 Fencing Club  
 French Club (L'Amicale des Gaulois)  
 Horns 'N' Halos (Square dance)  
 Indian Association  
 Inland Surfing Club  
 Insurance Society  
 Karate Club

KASN Radio  
 La Liga Panamericana (Promotes friendly relations among those interested in things Spanish)  
 Law Students' Alliance  
 Memorial Union Art and Display Division  
 Memorial Union Entertainment Division  
 Memorial Union Ideas and Issues Division  
 Memorial Union Special Events Division  
 Mexican-American Student Organization  
 Model United Nations of the Far West  
 Oriental Students Club  
 Outing Club (Promotes outdoor activities)  
 Phoenix Area Draft Resistance  
 Players Club  
 Political Science Graduate Students Association  
 Quantitative Systems Club  
 Radical Student Union  
 Rugby Club  
 Russian Club  
 Sigma Gamma Chi  
 Sno Devils (Ski Club)  
 Student-Faculty Tenants Association  
 Student International Mediation Society  
 Student Mobilization Committee to End the War in Viet Nam  
 Students for Peace  
 Students for Responsive Broadcasting  
 Sun Devil Archers  
 Sun Devil Rodeo Association  
 Tree Museum (Ecology)  
 Undergraduate Mathematics Club  
 Veterans Club  
 Young Americans for Freedom  
 Young Democrats  
 Young Republicans

Young Socialist Alliance  
 Youth International Party

**Religious Groups**

*For Women*

Lambda Delta Sigma (L.D.S.)

*For Both Men and Women*

Advance for Christ (Church of Christ)  
 American Baptist Student Movement  
 Baha'i College Club  
 Baptist Student Center  
 Bresee Fellowship (Nazarene)  
 Campus Crusade for Christ (Nondenominational)  
 Canterbury Association  
 Catholic Student Association  
 Christian Science College Organization  
 Church of God Collegiate Fellowship  
 Conservative Baptist Youth  
 Gamma Delta (Lutheran Church—Missouri Synod)  
 Geneva Forum (Christian Reformed Church)  
 Hillel Counsellorship (Jewish)  
 Inter-Varsity Christian Fellowship  
 Latter-Day Saints Student Association  
 Liahona Fellowship (Reorganized Church of Jesus Christ of Latter-Day Saints)  
 Logos (Christian newspaper)  
 Lutheran Students Association  
 Nichiren Shoshu of America  
 Student Religious Liberals (Unitarian)  
 3 Ho Yoga Club  
 United Campus Christian Fellowship  
 University Christian Fellowship  
 Wesley Foundation (Methodist)

## Residence Halls, Sororities and Fraternities

**Residence Hall Association.** The Residence Hall Association is composed of two or more elected representatives from each of the residence halls, one being the president of the hall.

**Residence Halls.** The following are the residence halls on the campus:

- M. O. Best A, B, C Wings
- Dixie Gammage Hall
- Hayden Hall
- Irish Hall
- Manzanita Hall
- McClintock Hall
- Palo Verde
- Palo Verde East
- Palo Verde West
- Sahuaro A, B, C, D Wings
- Wilson

**Panhellenic Council.** The Panhellenic Council is composed of two elected representatives from each sorority. The following national Greek letter organizations are represented on the campus:

- Alpha Delta Pi
- Alpha Kappa Alpha
- Alpha Phi
- Chi Omega
- Delta Delta Delta
- Delta Gamma
- Gamma Phi Beta
- Kappa Alpha Theta
- Kappa Delta
- Kappa Kappa Gamma

- Pi Beta Phi
- Sigma Sigma Sigma

**Interfraternity Council.** The IFC is composed of two elected representatives from each member fraternity, one being the president of the chapter. The following national Greek letter organizations are represented on the campus:

- Alpha Epsilon Pi
- Alpha Gamma Rho
- Alpha Tau Omega
- Delta Chi
- Delta Sigma Phi
- Delta Tau Delta
- Kappa Alpha Psi
- Kappa Sigma
- Lambda Chi Alpha
- Omega Psi Phi
- Phi Delta Theta
- Phi Gamma Delta
- Phi Kappa Psi
- Phi Sigma Kappa
- Pi Kappa Alpha
- Sigma Alpha Epsilon
- Sigma Chi
- Sigma Nu
- Sigma Phi Epsilon
- Theta Chi
- Theta Delta Chi
- Zeta Beta Tau

## Group Activities

**Musical Activities.** Opportunities are offered to all university students to become members of the performing organizations maintained

by the Music Department. College credit is given for regular work in Symphony Orchestra, Bands, University Chorus, Concert Choir, Opera Workshop, Men's Glee Club, Women's Chorus, and in special instrumental and vocal ensembles. Participation in any of the above groups without credit is also possible. Students in these organizations give local concerts, radio and TV performances, and regional and national tours.

**Intercollegiate Athletics — Men.** The University is a member of the Western Athletic Conference and the National Collegiate Athletic Association. Under the regulations of the Board of Regents, the Western Athletic Conference, the NCAA and the University, intercollegiate athletics at Arizona State University is governed by a board of faculty, students and staff and policies are administered under the President of the University by the Director of Athletics. All athletic grants-in-aid and scholarships are administered by the Faculty Committee on scholarships and student aid. Intercollegiate competition includes such sports as football, basketball, baseball, track and field, golf, tennis, swimming, gymnastics, wrestling and cross country.

**Intercollegiate Sports for Women.** The Women's Physical Education Department sponsors an intercollegiate sports program for women. Membership on teams is open to all college women. Competition includes inter-school games, matches and meets, sportsday and tournaments at the state, regional and national level.

**Intramurals — Men.** The University has a well-rounded intramural sports program designed to serve the needs of all men students. The sports are geared to individual and team competition. Included are: tennis,

volleyball, horseshoes, basketball, track and field, cross-country, tag football, golf, bowling, wrestling, and recreational sports.

**Intramurals for Women.** The program of intramurals for women is sponsored by the Women's Physical Education Department. Activities are open to all women in the University and are broad enough in scope to meet the interests of all women students.

**Recreational Facilities.** In addition to the recreational facilities provided by the residence halls and the Memorial Union, there is a heated swimming pool, two gymnasiums, tennis courts, handball courts, a number of playing fields, and athletic and recreational equipment for student use.

**Forensics.** Arizona State University sponsors a debate squad which is associated with Pi Kappa Delta national forensic honorary. Each year the squad travels to trophy tournaments sponsored by major universities throughout the United States. Participants engage in national competition in extemporaneous speaking, impromptu speaking, oral interpretation and oratory, as well as debate. Students may enroll for credit under SE 214 or participate in the forensic programming as an extra-curricular activity.

**Dance.** Dance programs and concerts are presented by members of the University Dance Theatre which is under the supervision of the dance faculty. Some of the programs are presented in the dance studio in the Women's Physical Education building, and the formal concert of the year is presented in Gammage Auditorium. Any student interested in performing is eligible to audition for the group.

**Drama.** All plays are produced by the

University Players under the supervision of the Speech and Theatre Department. In their modern theater in the Lyceum Building and in the Gammage Auditorium, the Players present nine major productions during the regular school year, plus many student-directed plays. All students are invited to participate in these activities. Outstanding upperclassmen are honored by membership in National Collegiate Players, the national honorary dramatic fraternity.

**Radio and Television.** The Bureau of Broadcasting provides students enrolled in Mass Communications classes with a working laboratory completely equipped with the finest professional radio and television facilities.

Students majoring in radio-television, and others interested in participating on an extra-curricular basis, assist in the operation of KAET, the University's educational television station.

### Student Publications

**The State Press.** Under the Board of Student Publications and in cooperation with the Department of Mass Communications, there is published throughout the year a university-owned, student-operated newspaper, the *State Press*. It is distributed to students on campus, student subscriptions being included in the activity fee. Staff work on the *State Press* serves as professional training for students enrolled in journalism courses.

**Sahuaro.** The University yearbook, *Sahuaro*, is student edited and published. Art and photography students, future teachers planning to supervise high school publications, and others interested in a major student activity find *Sahuaro* work especially rewarding.

### Memorial Union

The Memorial Union is a community center for all members of the University family — students, faculty, administration, staff, alumni and guests. Facilities of the Memorial Union include comfortable lounges on each floor, two ballrooms, diversified dining areas, and meeting rooms for official University organizations, departments and colleges. Reservations for use of these facilities may be made in the Memorial Union Reservation Office. Headquarters for Associated Students and the *Sahuaro* yearbook are located on the second floor. Services of the Union include a general information desk, lost and found, barbershop, Western Union, notary public and free telephones.

"The Village," MU Lower Level, houses a "sidewalk cafe," the University Bookstore, television lounge, movie house and a well equipped games room. The offices of the Memorial Union Activities Staff and the student committees who plan programs for the Memorial Union throughout the year are also here. Programs include "pop-ups" which occur "somewhere in the Union," Film Festivals, traditional seasonal parties, coffee house circuits with popular entertainers, art exhibits and seminars. Additional services offered in the area include dark-rooms, music listening, ditto machines, typewriters, service telephones, staplers and miscellaneous articles.

# Classification of Courses

The course numbering system has been designed to facilitate sorting and tabulating by machine methods.

Each college and school has a code number to which departmental offerings and subject fields are related.

A complete list of code letters, subject fields and departments or divisions in which the courses are offered appears in each issue of the *Schedule of Classes*.

The University course numbering system is as follows:

100-299 are freshman and sophomore level courses and are designed primarily for these students. Certain courses are closed to freshmen unless they have had the designated prerequisites. This fact may be obtained from the catalog or from curriculum advisor prior to registration.

300-499 are junior and senior level courses and are designed primarily for these students and other advanced students. When approved for inclusion in an individual program of graduate study by a supervisory committee appointed by the Dean of the Graduate College, selected 300-499 courses may serve the needs of individual graduate students.

500-799 are the graduate level courses open only to graduate students under the conditions posed by their respective programs of study. However, eligible seniors, with the approval of the Dean of the Graduate College, may enroll in certain courses at the 500 level. Ordinarily 700-level courses are reserved for doctoral students.

**Pro-Seminar 498.** Small group study and research for advanced students within their major area. Prerequisite: Major in the department or approval of instructor. Credit, 1-7 hours.

**Independent Study 499.** The course numbered 499 has been reserved for Independent Study courses in each of the instructional departments or divisions of the colleges at the undergraduate level. Independent Study courses are honor courses and may be taken only by outstanding senior students who have completed at least one semester in residence. Graduate students may also enroll in Independent Study as part of the program of study approved by their supervisory committee and the Dean of the Graduate College. To be eligible for an Independent Study course a student must have a cumulative scholarship index of 3.00 or better in his major or field of specialization.

An Independent Study course is designed to provide an opportunity for the superior senior student or for the graduate student to do an original study or investigation in his major or field of specialization on an individual basis with a minimum of supervision or direction. An Independent Study course is not to be regarded as a substitute for a catalog course, nor as a means of taking a catalog course on an individual basis. Courses listed in the catalog may not be taken as Independent Study courses.

Application for Independent Study courses must be made well in advance of regular registration period with the student's advisor. The application must be signed by the advisor, and approved by the instructor under whom the student will work, and by the chairman of the department or head of the division in which the course is taken. A course fee may be required. Credit, 1-3 hours.

**Special Liberal Arts Courses.** Liberal Arts 400 and Liberal Arts 401 are interdisciplinary courses offered by the College of Liberal Arts. LI 400 (*Concepts of Man*) is designed for small group study; LI 401 (*The Meaning of the 20th Century*) follows a lecture structure and is open to all upper division students and to others by permission of the instructor.

**Honors Courses.** The courses listed in the schedule as 298 and 492 (Honors Individual Study), 493 (Honors Thesis) and 497 (Honors Colloquium) are reserved for students in the Honors Programs in each of the Colleges. Credit, 2-6 hours.

**Special Graduate Courses.** Special Graduate courses for Research Methods (500), Practicum (580), Internship (584), Reading and Conference (590), Seminar (591), Research (592), Thesis (593), Conference and Workshop (594), Research Methods (600), Applied Project (601), Practicum (680), Field Work (683), Internship (684), Reading and Conference (690), Seminar (691), Research (692), Research Methods (700), Practicum (780), Field Work (783), Internship (784), Reading and Conference (790), Seminar (791), Research (792), Dissertation (799), are set forth in announcements of the Graduate College and are also listed in the respective departments, where offered.

**Prerequisites.** A student registering for a course must meet the prerequisites listed for it or otherwise satisfy the instructor that he has had the equivalent preparation.

**Withdrawal of Courses.** The University does not offer each year all of the courses listed in the catalog. The *Schedule of Classes* should be consulted for those courses offered each semester and during the summer terms.



Charles Trumbull Hayden Library and University Mall

# College of Liberal Arts

GEORGE A. PEEK, JR., PH.D.

*Dean*

## Purpose

The College of Liberal Arts provides the student an opportunity to obtain a broad, balanced, liberal education. In order to guide his life intelligently in a highly complex and rapidly changing world, a person must have an understanding of modern science, of the roots of civilizations, of the nature of our present world, and of the expression of this world in literature, philosophy and the arts. The Liberal Arts College attempts to develop the qualities of mind and impart the types of knowledge that will enable the student to understand the world in all its complexity and variety. As a consequence, the College does not, for the most part, offer training designed merely to prepare the student to take on a particular job; it offers, more significantly, a broad education designed to help the student in the career of living.

Within the framework of the curriculum, each student, with the assistance of a faculty advisor, determines his own program to fit his particular aims. Vocational interests are taken into consideration within this context, and students may prepare for professional schools, graduate work or particular careers.

## Organization

The College of Liberal Arts is organized into the following departments of instruction:

- Aerospace Studies
- Anthropology
- Botany and Microbiology
- Chemistry
- English
- Foreign Languages
- Geography
- Geology

- Health, Physical Education and Recreation

- History

- Home Economics

- Mass Communications

- Mathematics

- Military Science

- Philosophy

- Physics

- Political Science

- Psychology

- Sociology

- Zoology

## Degrees

**Bachelor of Arts Degree.** The curriculum for the degree Bachelor of Arts is designed to give the student a broad, general background in the principal fields of human knowledge and at the same time provide for a reasonable amount of specialized training in a selected area.

A major consists of approximately 45 semester hours of credit. Normally, not more than 30 semester hours will be taken in the subject field of the major, and approximately 15 semester hours in one or more related fields. The exact content of the major is selected by the student in consultation with the advisor under the rules and regulations of the department concerned. No credit will be granted toward fulfilling major requirements in any upper division course in the student's major unless the grade in that course is at least a "C".

Knowledge in *one* foreign language is required equivalent to the level obtained through 16 hours of instruction in the elementary and intermediate courses on the

college level. A student who desires to fulfill the requirement in whole or in part through foreign language study in secondary schools, or in other noncollegiate institutions, must take a proficiency examination given by the Department of Foreign Languages to determine the level of placement. Students who transfer from other colleges with less than two years of credit in a foreign language will be placed in a course at the next level above the work completed.

**Bachelor of Science Degree.** The curriculum for the degree of Bachelor of Science is designed to give the student a broad, general background in the principal fields of human knowledge and an opportunity to specialize in one specific selected area of scientific endeavor.

The requirements for the major are determined by the department concerned. The exact content of the major is selected by the student in consultation with the advisor. No credit will be granted toward fulfilling major requirements in any upper division course in the student's major unless the grade in that course is at least a "C".

### Degree Requirements

A. All candidates for graduation in the Bachelor of Arts and Bachelor of Science degree curriculums are required to present at least 126 semester hours of credit of which at least 50 hours must consist of upper division courses.

B. In order to be classified in good standing in the College of Liberal Arts, a student who has earned 29 semester hours or less must have at least a 1.60 cumulative grade point index, a student who has earned 30 semester hours but less than 60 semester hours must have at least a 1.75 cumulative grade point

index, and a student must have achieved a 2.00 cumulative grade point index no later than the semester in which he has earned a total of 60 semester hours. A cumulative grade point index of 2.00 is required for graduation.

C. All students must demonstrate reasonable proficiency in written English. If a student receives a grade of "C" or better in both EN 101 and EN 102, or in EN 104 or its equivalent, he will be presumed to have demonstrated the necessary degree of writing proficiency. Otherwise, he must successfully complete a written English Proficiency Examination. The examination will be given at least twice a year, and a student must take it during the semester immediately following the completion of EN 102 or EN 104 or its equivalent. A student who does not complete the examination successfully on the first try must enroll in an English course prescribed by the Director of Freshman English. A student who receives a grade of "C" or better in such a course will be considered to have satisfied the proficiency requirement. Otherwise, he must repeat the above procedure until he has demonstrated the necessary degree of writing proficiency. Any questions concerning the English Proficiency Requirement should be addressed to the Director of Freshman English.

**General Studies Program.** To meet the General Studies requirement in Liberal Arts, all students must take a minimum of 54 semester hours of credit from the departments listed below, EXCLUDING courses in the subject field of the major but INCLUDING courses in related fields normally considered as part of the major. All students who complete this requirement will automatically satisfy the University General Studies requirement.

To assure breadth and encourage depth within the 54-hour requirement all Liberal Arts students must meet the following *minimum* distribution pattern:

HUMANITIES AND FINE ARTS: 12 hrs.  
 SOCIAL AND BEHAVIORAL SCIENCES: 12 hrs.  
 SCIENCES AND MATHEMATICS: 12 hrs.

COURSES IN A SINGLE DEPARTMENT CANNOT BE USED TO FULFILL BOTH THE SOCIAL SCIENCE AND NATURAL SCIENCE REQUIREMENTS.

HUMANITIES AND FINE ARTS. Courses in the following departments fulfill the minimum 12-hour requirement:

Architecture (AP courses *only*)  
 Art History (AH courses *only*)  
 English (all courses *except* EN 101, 102, 104)  
 Foreign Languages (all courses *except* those used to satisfy College foreign language proficiency requirement)  
 Humanities  
 Music (MU courses *only*)  
 Philosophy

SOCIAL AND BEHAVIORAL SCIENCES. Courses in the following departments fulfill the minimum 12-hour requirement:

Anthropology  
 Economics  
 Geography – Cultural (GC courses *only*)  
 History  
 Political Science  
 Psychology (PX courses *only*)  
 Sociology



**SCIENCES AND MATHEMATICS.** Courses in the following departments fulfill the minimum 12-hour requirement. At least one course *must* include a laboratory section and at least two courses *must* be taken in the same department:

- Botany and Microbiology (all BI, BO, and MI courses)
- Chemistry
- Geography – Physical (GP courses *only*)
- Geology
- Mathematics (all courses *except* MA 116)
- Physics (PH and PA courses *only*)
- Psychology (PY courses *only*)
- Zoology (all BI, ET, and ZO courses)

To complete the 54-hour requirement, additional courses may be taken from the above departments as limited by the exceptions indicated, and from the following:

- Art
- Health, Physical Education and Recreation (HE 100, 481; DN 160, 280, 380; PE 161, 385, 386; RE 260, 372 *only*)
- Home Economics (CD 232; MF 231, 254, 331, 354, 435; FN 141; DA 171, 474 *only*)
- Mass Communications
- Music
- Speech and Theatre

**Majors Offered in the College of Liberal Arts.** For specific major requirements, see statements under each department following this introductory section:

**MAJORS WITH DEGREES OFFERED:**

- Anthropology (B.A., B.S.)
- Biology (B.S.)
- Botany (B.S.)
- Boys' Club Administration (B.S.)
- Chemistry (B.A., B.S.)
- Chinese (B.A.)
- Economics (B.A., B.S.)
- English (B.A.)
- Entomology (B.S.)
- French (B.A.)
- Geography (B.A., B.S.)
- Geology (B.A., B.S.)
- German (B.A.)
- Health Education (B.S.)
- History (B.A.)
- Home Economics (B.A., B.S.)
- Journalism (B.A., B.S.)

**DEPARTMENT:**

- Anthropology*
- Botany and Microbiology; Zoology*
- Botany and Microbiology*
- Health, Physical Education and Recreation*
- Chemistry*
- Foreign Languages*
- Economics*
- English*
- Zoology*
- Foreign Languages*
- Geography*
- Geology*
- Foreign Languages*
- Health, Physical Education and Recreation*
- History*
- Home Economics*
- Mass Communications*

Mathematics (B.A., B.S.)  
 Medical Technology (B.S.)  
 Microbiology (B.S.)  
 Philosophy (B.A.)  
 Physical Education (B.S.)  
 Physics (B.S.)  
 Political Science (B.A., B.S.)  
 Psychology (B.A., B.S.)  
 Radio-Television (B.A., B.S.)  
 Recreation (B.S.)  
 Russian (B.A.)  
 Social Welfare (B.A., B.S.)  
 Sociology (B.A., B.S.)  
 Spanish (B.A.)  
 Wildlife Biology (B.S.)  
 X-Ray Technology (B.S.)  
 Zoology (B.S.)

*Mathematics*  
*Botany and Microbiology*  
*Botany and Microbiology*  
*Philosophy*  
*Health, Physical Education and Recreation*  
*Physics*  
*Political Science*  
*Psychology*  
*Mass Communications*  
*Health, Physical Education and Recreation*  
*Foreign Languages*  
*Sociology*  
*Sociology*  
*Foreign Languages*  
*Zoology*  
*Botany and Microbiology*  
*Zoology*

**The No Preference Option.** The “no preference” is offered only in the College of Liberal Arts. It is designed for the student who is undecided about his choice of major and about his career goals. Students who elect the “no preference option” are subject to all general requirements and policies of the College, but in addition they receive intensive academic and personal counseling from advisors assigned to the Student Academic Affairs Center, located in Social Science Building 111.

A student may elect the “no preference option” upon entering the College as a new freshman or anytime through the semester in which he earns 60 credit hours. During that semester or before, the student, in consultation with his advisor, selects a major and transfers into the department offering it.

Thereafter, he receives advisement from faculty advisors in that department. **NOTE:** Students who wish to enter a program of study which has a rigidly structured curriculum should be aware that delay in choosing a major *initially* could result in added time and cost.

### Graduate Degrees

**Master's Degrees.** A graduate program consisting of a minimum of 30 semester hours of approved work in a special field of study leads to the degrees of Master of Arts, Master of Science, Master of Natural Sciences, and Master of Public Administration. For specific reference to these degrees, see Graduate College section of this catalog.

**Doctor of Philosophy Degree.** A graduate program consisting of three academic years of work beyond the bachelor's degree as prescribed by the Graduate Council leads to the Doctor of Philosophy degree. For specific reference to this degree, see Graduate College section of this catalog.

### Special Programs

**Honors Program.** The Honors Program is designed to provide special educational opportunity for serious students with exceptional ability. The program, particularly in the junior and senior years, emphasizes independent study and creative work in the student's area of specialization.

Entering freshmen are not eligible for admission to the program. However, any interested student whose Admission Certificate has the notation, “Honors at Entrance,” may, with the approval of his advisor, register in the Honors section of 100-level courses.

**ADMISSION TO HONORS:** A student may apply to the Honors Council for admission to the Honors Program after the completion of one semester of full-time work at Arizona State University or another comparable college or university. The applicant must have a cumulative grade index of not less than 3.40, unless otherwise accepted by the Council, and must be recommended by the Honors advisor in his major department. The application must be made in sufficient time to permit the student to meet the Honors Program graduation requirements.

**RETENTION IN HONORS:** An Honors Program student is required to complete a full-time program of study each semester, and must maintain a cumulative index of not less than 3.25. An Honors student may leave the Honors Program at any time he desires. All

courses he takes while in the Program count toward his graduation, regardless of whether he graduates in Honors.

**COURSE REQUIREMENTS IN HONORS:** An Honors student is required to average at least one Honors course for each semester of participation in the Program, and in any case must complete a minimum of 12 semester hours of work in Honors courses. The Honors work must include at least two semesters of work in upper division Honors courses or colloquiums in departments which are not the major department of the student. This requirement may be relaxed if suitable Honors offerings are not available, in which case the student's Honors advisor should so inform the Council by letter.

**GRADUATION IN HONORS:** For graduation in Honors, the student must:

- (1) Meet the Honors course requirements.
- (2) Pass, in his senior year, a comprehensive examination in his major field. The examination will be conducted and graded by a committee consisting of the departmental Honors advisor and colleagues chosen by the advisor.
- (3) Complete an acceptable Honors thesis or creative project in his major field. The thesis or project will be examined and graded by a committee consisting of the departmental Honors advisor and colleagues chosen by the advisor.

A student who satisfies these requirements will graduate *cum laude* if his cumulative grade index is between 3.25 and 3.49. For cumulative grade indexes in the ranges of 3.50 to 3.74 or 3.75 to 4.00, graduation will be *magna cum laude* or *summa cum laude*, respectively, provided the examination and thesis grades are of comparable quality.

**PARTICIPATING DEPARTMENTS:** HONORS

majors are offered in the Departments of Botany and Microbiology, Chemistry, Economics, English, Foreign Languages, Geography, Geology, History, Mass Communications, Mathematics, Philosophy, Physics, Political Science, Psychology, Sociology, and Zoology.

**Pass-Fail Courses.** The Liberal Arts Pass-Fail program is intended to broaden the education of students in the College of Liberal Arts by encouraging them to take advanced courses outside their fields of specialization. When a student is enrolled in a course for Pass-Fail, he will receive either the mark of "P" or the grade of "E." The mark of "P" results in credit for the course, but does not affect the cumulative grade point index. A grade of "E" will be averaged into the index as usual.

Under the conditions stated below, students enrolled in the College of Liberal Arts may take for Pass-Fail any courses in the 300 and 400 series offered by the College of Liberal Arts with the exception of Independent Study 499.

1. Enrollment in a course for Pass-Fail must be explicitly indicated during registration. After the close of Late Registration, no student may change registration in any course to or from Pass-Fail.

2. No course may be taken for Pass-Fail which is offered by the student's major department, or counted towards the major, or is required by the department to support or supplement the major. Up to four courses of Pass-Fail may be counted toward graduation requirements other than the major.

3. Pass-Fail courses may be taken only by students with a total of at least 60 semester hours of earned credit and a cumulative grade point index of at least 2.00.

4. One Pass-Fail course may be taken during a semester. The minimum semester load, including the Pass-Fail course, must total at least 12 hours. No overloads can be authorized for the semester in which the Pass-Fail course is taken.

5. Pass-Fail courses may not be taken during the summer sessions, in extension, or by correspondence.

**Undergraduate Credit for Graduate Courses.** To enable interested students to benefit as much as possible from their undergraduate studies, the Graduate College and the College of Liberal Arts extend to undergraduate students, with a grade point index of at least 2.00, the privilege of taking 500-level graduate courses for undergraduate credit with the approval of the instructor. Application for admission to a graduate course for undergraduate credit must be completed in advance of the regular registration period. The application must be approved by the advisor, the instructor of the 500-level graduate course, and by the chairman of the department which offers the course.

**Interdisciplinary Studies.** Within the framework of a regular major chosen from those listed on pages 50-51, a student may, in consultation with his advisor, use courses outside his major subject field to put together a program of interdisciplinary studies. Recommended programs in Latin American Area Studies, Asian Studies, and American Studies are described below. For further information, consult the Director of the Center for Latin American studies. Students interested in American Studies may obtain information from the Office of the Dean of the College of Liberal Arts.

**AMERICAN STUDIES.** The development of insight into the complexities and inner work-

ings of modern American society is a unique interdisciplinary task for which universities are especially suited. To foster and coordinate activities with this objective at Arizona State University, an American Studies program has been established. The current program emphasizes studies in the history, cultures and problems of racial minorities in America. The program will be expanded as conditions warrant.

Although a minor is not required by the College of Liberal Arts, a minor in American Studies is offered for those who desire it. A minor consists of at least 18 hours of approved courses. A list of approved courses is given below. A current list appears in the *Schedule of Classes* each semester. Courses included in the minor may also be used for General Studies credit but not as credit toward a major.

In addition to regular courses, the program includes seminars, public lectures and related extracurricular activities. Inquiries about the program should be directed to the Office of the Dean of the College of Liberal Arts.

Courses Approved for a Minor in American Studies. (*For course descriptions refer to the course offerings by departments.*)

- 1AN 411—Cultural Anthropology
- 1AN 414—Cultural Systems
- 1AN 483—Ethnographic Practice
- 1HI 304—American Cultural History
- 1PS 439—Minority Group Politics in America
- ISO 341—Modern Social Problems
- ISO 352—Social Change
- ISO 371, Social Welfare as a Social
- ISO 372—Institution
- ISO 440 —Racial and Ethnic Minorities

*Black Studies*

- 1AN 322—Peoples of Africa
- 1EN 358—Afro-American Literature
- 1HI 333—Black American Experience
- 1HI 498—Pro-Seminar (Black Culture)
- ISO 454—The Afro-American in Modern Society
- OA 326—African Art

*Mexican-American Studies*

- 1HI 433, 434—The Southwest
- 1HI 339—The Mexican-American Experience
- ISO 455—The Mexican-American in Modern Society (Not yet offered)
- 1SP 103, 104—Elementary Spanish\*
- 1SP 203, 204—Intermediate Spanish\*
- 1SP 323—Mexican-American Literature
- 1SP 427, 428—Spanish-American Literature
- 1SP 472—Spanish-American Civilization
- 1PS 454—Government and Politics in Mexico
- 1PS 463—Inter-American Relations
- 2SP 533—The Bilingual Child

\*For Spanish-speaking students only

*American Indian Studies*

- 1AN 421—The North American Indian
- 1HI 401—History of Arizona
- 2IE 411—Indian Education

ASIAN STUDIES. The Center for Asian Studies is designed to encourage and coordinate student, faculty and public study of the area through the support of public lectures, research and curricular development. An interdisciplinary undergraduate program has been developed to prepare undergraduates for governmental or private employment or

for admission to graduate programs at other institutions.

In the program a separate major in Asian Studies is not offered. Instead, the student must fulfill the requirements of a departmental major as well as the other degree requirements of the College. The Asian Studies requirements consist of a minimum of two years of Chinese or Japanese and 30 semester hours of wholly Asian area courses. In consultation with the Asian Studies advisor in his major, the student can design a program of studies which will be largely integrated into general requirements by carefully drawing upon Asian area courses in the major, those acceptable as related field courses in the major, and those suitable for fulfillment of the General Studies requirements in the humanities and social sciences. Fulfillment of these requirements will qualify able students for admission to graduate programs and will be recognized at graduation by a bachelor's degree with a major in the Discipline-Asian Studies: For example, History-Asian Studies. For further information, consult the Director of the Center for Asian Studies.

LATIN AMERICAN AREA STUDIES. Arizona and Latin America have been entwined by history and geography. With a large Spanish-speaking population and a location near the Mexican border, the Phoenix-Tempe area has a genuine continuing interest in Latin America. At Arizona State University, the Center for Latin American Studies guides the students whose degree programs include an emphasis in Latin American course work and research.

The area studies program gives students an understanding of public affairs, culture and national trends in the Latin American nations. The course of study stresses a



Language and Literature Building

knowledge of politics, history, Spanish, geography, economics and related topics.

The student should major in political science, history, Spanish, geography or economics, completing 30 semester hours in one of these disciplines. A student in Latin American studies must also complete 15 hours of Latin American content courses in related fields other than his major field, with his total of Latin American courses being 30 semester hours when major and related fields are counted. A reading knowledge of Spanish is required and a reading knowledge of Portuguese is recommended. Fulfillment of these requirements will be recognized at graduation.

The Center for Latin American Studies issues research reports on the current public affairs of Latin America and publishes the journal *Latin American Digest*, with a readership encompassing scholars in major universities and many libraries in the United States and foreign countries. The Center publishes reference books on Latin American leaders.

The Center serves as a university liaison with various organizations, throughout the state and nation involved with Latin America, such as the Mexican-American Chamber of Commerce, Friends of Mexican Art, Hispanic Society of America, Inter-American Press Association, and Arizona-Sonora Trade Commission. The Center is a member of the Latin American Studies Association, the Rocky Mountain Council on Latin American Studies, the Pacific Coast Council on Latin American Studies, and the Southwestern Council on Latin American Studies.

#### **Professional Programs**

**SECONDARY EDUCATION.** A student majoring in the College of Liberal Arts may obtain a Bachelor of Arts or Bachelor of Science

degree in Liberal Arts and meet the requirements for a secondary education certificate. The student must meet all requirements established by the College of Education, including professional education courses and directed teaching, and all the College and departmental requirements for the major degree program in the College of Liberal Arts. For information regarding the requirements of the College of Education, the student should consult the Department of Secondary Education.

**MEDICAL TECHNOLOGY AND X-RAY TECHNOLOGY.** These two programs are offered as majors for the degree of Bachelor of Science in the Department of Botany and Microbiology. Information regarding these major degree programs may be obtained from the medical technology and X-ray technology advisors in the Department of Botany and Microbiology.

**RESERVE OFFICERS TRAINING PROGRAM.** The Departments of Aerospace Studies and Military Science offer professional training through which students may become commissioned officers in the armed services. The training programs are described in the catalog on pages 26-28. These programs are available to properly qualified students in all colleges at the University, and are taken along with the regular academic degree program in which the student may be enrolled.

**Special Liberal Arts Courses:**

Liberal Arts 400 and 401 are interdisciplinary courses offered by the College of Liberal Arts. LI 400 (*Concepts of Man*) is designed for small group study; LI 401 (*The Meaning of the 20th Century*) follows a lecture structure and is open to all upper division students and to others by permission of the instructor.

**Pre-Professional Programs.** The College of Liberal Arts offers, through the regular major degree programs listed on pages 50-51, preparation for graduate and professional study and for future in-service training. The locations of faculty advisors who can provide information regarding the listed professional fields are indicated below.

PROFESSIONAL FIELD:	OFFICE WHERE ADVISOR IS LOCATED:
Architecture**	Pre-Architecture Office
Bilingual Secretarial	Department of Foreign Languages
Dentistry*	Pre-Medical Office
Foreign Service	Department of Political Science
Law	Department of Political Science
Medicine*	Pre-Medical Office
Ministry	Department of Philosophy
Occupational Therapy	Department of Health, Physical Education and Recreation
Optometry	Department of Physics
Osteopathy*	Pre-Medical Office
Pharmacy	Department of Chemistry
Physical Therapy	Department of Health, Physical Education and Recreation
Public Safety	Institute of Public Administration and Department of Sociology
Public Service Training Program	Institute of Public Administration
Social Welfare	Department of Sociology

\*Upon choosing an appropriate major, students preparing for medicine, dentistry, or osteopathy should register with the Pre-Medical Office located in the Office of the Dean, College of Liberal Arts. Evaluations are scheduled in April and October.

\*\*Students preparing for architecture should register with the Pre-Architecture Office located in the Office of the Dean, College of Liberal Arts.

In addition to consulting advisors, students preparing for admission to professional schools should obtain information regarding admission requirements by writing directly to the schools in which they may be interested.

**LI 400 Concepts of Man.** Critical analysis of the concepts of man and his environment. Small group study with enrollment selected to insure a full range of academic majors, by approval of the instructor only. Credit, 3 hours.

**LI 401 The Meaning of the 20th Century.** A cross-disciplinary attempt to identify the major intellectual and phenomenological thrusts of the contemporary world. Open to juniors and seniors or by approval of the instructor. Credit, 2 to 3 hours.

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## Aerospace Studies

(Air Force ROTC)

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**Professor:**

REDDRICK (Old Main)

**Associate Professors:**

BOWERSOCK, CAPPS, SUKUT, HERNANDEZ

**\*AS 101 Aerospace Studies.** How the defense machinery of the United States, and particularly that of the Air Force, serves the nation. Nature and principles of war, national power. Department of Defense and Air Force strategic offensive and defensive forces. Two lectures, 1 hour Leadership Laboratory (101L). Credit, 3 hours.

**102 Aerospace Studies.** One hour Leadership Laboratory, initial military experiences in customs and courtesies, environment of an Air Force officer, Air Force as a career, drill and ceremonies. Credit, 1 hour.

**201 Aerospace Studies.** Military customs and courtesies, giving military commands and the correcting and evaluation of such skills. Learning the considerations of becoming an Air Force officer. Prerequisites: AS 101 and 102, or equivalent. One hour Leadership Laboratory. Credit, 1 hour.

**\*202 Aerospace Studies.** Military general purpose forces, aerospace support forces, alliances and collective security and the struggle for peace. Prerequisites: AS 101 and 102 or equivalent. Two lectures, 1 hour Leadership Laboratory (202L). Credit, 3 hours.

**\*301 Aerospace Studies.** Principles and techniques of communicative skills, growth and development of the United States aerospace power, future of manned aircraft. Prerequisites: AS 201, 202 or equivalent. Two lectures, 1 hour Leadership Laboratory (301L). Credit, 3 hours.

**\*302 Aerospace Studies.** History of space program, space operations, future development

in space and career specialty orientation. Prerequisites: AS 201, 202 or equivalent. Two lectures, 1 hour Leadership Laboratory (302L). Credit, 3 hours.

**\*401 Aerospace Studies.** Studies in depth the need for Air Force leadership, discipline and variables effecting leadership. Prerequisites: AS 301, 302. Two lectures, 1 hour Leadership Laboratory (401L). Credit, 3 hours.

**\*402 Aerospace Studies.** The professional officer, military management and preparation for commissioning. Prerequisites: AS 301, 302. Two lectures, 1 hour Leadership Laboratory (402L). Credit, 3 hours.

**403 Flight Instruction.** Flight instruction (36½ hours of both dual and solo instruction); 36 hours ground school. Prerequisites: AS 301, 302. Students receive FAA private pilot's license. No credit.

\*Courses include 1 hour Leadership Laboratory for which each student must register when registering for the basic course; i.e., students taking AS 101 must also register for 101L.

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## Anthropology

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**Professors:**

RUPPE' (SS 100E), DITTERT, STEWART

**Associate Professors:**

MORRIS, FIRESTONE, TURNER

**Assistant Professors:**

ALPHER, BAHR, CLARK, MARTIN,  
SCHOENWETTER

### Departmental Major Requirements

#### Bachelor of Arts Degree Curriculum

ANTHROPOLOGY – Consists of 46 semester hours of credit, of which 31 must be in anthropology and 15 in related fields to be approved by the advisor in consultation with the student. Courses AN 101, 102, 311, 331,

341, and 412 are required. An additional 12 hours in anthropology will be approved by the advisor in consultation with the student. At least 18 semester hours must be in upper division courses.

#### Bachelor of Science Degree Curriculum

ANTHROPOLOGY – Consists of 53 semester hours of credit, of which 30 must be in anthropology and 23 hours in one of three curriculum options to be approved by the advisor in consultation with the student. Eight semester hours credit are required in a foreign language. Required courses in anthropology are AN 101, 102, 311, 331, 341 and 412. Options are: (1) archaeology, (2) physical anthropology, and (3) social-cultural anthropology. At least 18 semester hours must be in upper division courses.

#### Departmental Minor Teaching Field Requirements (Secondary Education)

ANTHROPOLOGY – Consists of 18 semester hours of credit in anthropology. Courses AN 101 or 102, and 311, 331, 341, 364 and 412 are required. One other course may be taken in lieu of AN 364, dependent upon the interest of the student.

#### Departmental Graduate Program

The Department of Anthropology offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

**AN 101 Origin and Development of Man and Culture.** Physical anthropology and archaeology. Evidence and processes of human evolution and of culture change. Primates. Fossil men and their tools. Race, variation and

heredity. Man and his environment. Prehistoric culture and society. Credit, 3 hours.

**102 Introduction to Cultural and Social Anthropology.** Basic principles of cultural and social anthropology, with illustrative materials from a variety of cultures. The nature of culture. Material culture and technology. Social, political and economic systems, religion, esthetics and language. Culture growth and social change. The effect of culture upon the development of personality. Credit, 3 hours.

**221 Indians of the Southwest.** Cultures of living Indian tribes — Navajo, Hopi, Pima, Papago, Apache, Mohave, and others. Credit, 3 hours.

**231 Archaeological Field Methods.** Excavation of archaeological sites and recording and interpretation of data. Includes field experience in this locality. Two lectures, 8 hours laboratory. Credit, 3 hours.

**232 Anthropological Field Session.** Basic anthropological field techniques; guidance in solving representative problems. Prerequisite: approval of instructor. May be repeated for credit. Credit, 1-5 hours.

**311 Principles of Social Anthropology.** Comparative analysis of domestic groups and economic and political organizations in primitive and peasant societies. Credit, 3 hours.

**314 Primitive Religion.** Origins, elements, forms and symbolism of religion; a comparative survey of primitive religious beliefs and ceremonies; the place of religion in the total culture. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**315 Primitive Arts and Technology.** Comparative survey of the material culture of peoples of the world, emphasizing production and use of artifacts. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**322 Peoples of Africa.** Races and cultures of the peoples of Africa, past and present, with special emphasis on the Negroid peoples. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**323 Peoples of Asia.** Races and cultures of Asia, including the more complex cultures of India, China, Japan and related areas. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**330 Principles of Archaeology.** Prehistoric man. Survey of dating methods, field techniques and artifactual inventories. Geographic, climatic and geological relationships. Credit, 3 hours.

**331 Prehistory.** Development of Old World cultures from the Old Stone Age through the Iron Age. Credit, 3 hours.

**334 Arctic Anthropology.** An aerial survey of past and present Aleut-Eskimo prehistory, origins, physical features, adaptations, variation and culture with comparisons of Asian Arctic populations. Prerequisite: AN 101 or approval of instructor. Credit, 3 hours.

**335 Southwestern Archaeology: Hohokam and Mogollon.** Prehistoric cultures of the desert and mountain regions of the Southwest. Southern Paleo-Indian, Hohokam, and Mogollon sequences are analyzed and compared. Prerequisite: AN 101 or approval of instructor. One weekend field trip. Credit, 3 hours.

**336 Southwestern Archaeology: Basket Maker and Pueblo.** Prehistoric Basket Maker and Pueblo cultures of the Southwest. Cultural sequences leading to the modern pueblos are analyzed. Prerequisite: AN 101 or approval of instructor. Credit, 3 hours.

**341 Physical Anthropology.** Osteology, fossil men, anthropometry, description and analysis of archaeological and contemporary human populations. Prerequisite: AN 101 or approval of instructor. Three lectures, 3 hours laboratory. Credit, 4 hours.

**342 Physical Anthropology.** Gene frequencies, clines, polymorphisms, population dynamics; description and analysis of human populations. Prerequisite: AN 101 or approval of instructor. Two lectures, 3 hours laboratory. Credit, 3 hours.

**346 Human Origins.** Man's place in nature, fossil men, historic and recent concepts of human races, influence of culture on human evolution. Credit, 3 hours.

**351 Culture and Personality.** Survey of approaches to the interrelations between the personality system and the socio-cultural environment. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**364 Museum Techniques.** Laboratory techniques in restoration of artifacts. Museum display practices to present anthropological material. Prerequisite: AN 101 or approval of instructor. Credit, 3 hours.

**365 Laboratory Methods in Archaeology.** Techniques of artifact analysis. Basic archaeological research techniques, methods of report writing. Prerequisite: AN 101 or approval of instructor. May be repeated for credit. Credit, 3 hours.

**381 Introduction to Linguistics.** Descriptive and historical linguistics. Survey of theories of human language, emphasizing synchronic linguistics. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**382 Linguistic Theory: Syntax.** Contemporary theories of the grammatical structure of languages. Prerequisite: AN 381 or FL 400 or approval of instructor. Credit, 3 hours.

**383 Linguistic Theory: Phonology.** Contemporary theories of the sound system of languages. Prerequisite: AN 381 or FL 400 or approval of instructor. Credit, 3 hours.

**412 Peoples of the World.** Ethnographic survey of the peoples and cultures of Eurasia, Africa, Oceania and the Americas. Intensive analysis of selected cultures from representative culture areas. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**414 Cultural Systems.** Signs, symbols, meanings, values, cognitive systems, language, art, myth and ritual. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**415 Primitive Art.** Descriptive survey of the art forms of primitive people in relationship to their cultural setting. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**416 Economic Anthropology.** Economic behavior and the economy in pre-industrial societies; description and classification of exchange systems; relations between production, exchange systems and other societal subsystems; problems in economic change and growth with the focus on primitive and peasant societies. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**421 The North American Indian.** Archaeology, ethnology and linguistic relationships of the Indians of North America. Does not include Middle America. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**422 Archeology of North America.** The origin, spread and development of the prehistoric Indians of North America up to the historic tribes. Does not include the Southwest. Prerequisite: AN 101 or approval of instructor. Credit, 3 hours.

**423 Archaeology of Mesoamerica.** Pre-Conquest cultures and civilizations of Mexico. The Aztecs, Maya and their predecessors. Prerequisite: AN 101 or approval of instructor. Credit, 3 hours.

**424 Indians of Mesoamerica.** Historic tribes and folk cultures. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**432 Advanced Anthropological Field Session.** Advanced training in anthropological field techniques, analysis of data and preparation of field reports. Prerequisite: AN 232 or approval of instructor. May be repeated for credit. Credit, 1-5 hours.

**435 Archaeological Pollen Analysis.** Theory, methodology and practice of pollen analytic techniques. Compares uses in botany, geology and archaeology. Field trips and laboratory. Prerequisite: approval of instructor. Two hours lecture and 2 hours laboratory. Credit, 3 hours.

**451 Primatology.** Nonhuman primates: structure, taxonomy, dispersion, fossil evidence and social behavior. Prerequisite: AN 101 or 341 or approval of instructor. Credit, 3 hours.

**452 Dental Anthropology.** Human and primate dental morphology, growth, evolution and genetics. Within- and between-group variation. Dental pathology and behavior-cultural-dietary factors. Prerequisite: approval of instructor. Two lectures, 3 hours laboratory. Credit, 3 hours.

**453 Fossil Man.** Detailed review and analysis of ancient African, Asian and European human and primate skeletal, dental and cultural remains. Human biological, behavioral and cultural evolution. Prerequisite: An introductory course in anthropology or zoology or approval of instructor. Credit, 3 hours.

**454 Paleopathology.** The role of pathology in human evolution with special emphasis on disease as an indicator of nutrition, phylogeny and behavior. Prerequisites: AN 101 and 341 or approval of instructor. Credit, 3 hours.

**472 Archaeological Ceramics.** Analysis and identification of pottery wares, types and varieties. Systems for ceramic classification and cultural interpretation. Prerequisite: approval of instructor. Two hours lecture, and 2 hours laboratory. Credit, 3 hours.

**479 The Anthropology of Peasant Peoples.** Description, comparison and theories pertaining to the social and community structure and world views of peasant peoples. Prerequisite: AN 102. Credit, 3 hours.

**481 Language and Culture.** Application of linguistic theories and findings to nonlinguistic aspects of culture; language change; psycholinguistics. Prerequisite: AN 102 or approval of instructor. Credit, 3 hours.

**482 Linguistic Practice.** Study of a non-Indo-European language with an informant. Prerequisite: AN 381 or FL 400 or approval of instructor. Credit, 3 hours.

**483 Ethnographic Practice.** Working with a native speaker of a non-Indo-European lan-

guage to elicit and analyze the concepts of his culture. Prerequisite: AN 381. Credit, 3 hours.

**511 Kinship and Social Organization.** Investigation of the meanings and uses of concepts referring to kinship, consanguinity, affinity, descent, alliance and residence in the context of a survey of the varieties of social groups, marriage rules and kinship terminological systems. Prerequisite: approval of instructor. Credit, 3 hours.

**513 Social Systems.** Basic concepts and concept systems in social research: social structure and social functions; structure, status, role and organization; social systems, economy and polity; problems in taxonomy and description. Prerequisite: approval of instructor. Credit, 3 hours.

**532 Graduate Field Anthropology.** Independent research on a specific anthropological problem to be selected by the student in consultation with the staff. Prerequisites: AN 432 or equivalent and approval of instructor. May be repeated for credit. Credit, 2-6 hours.

**543 Archaeological Cultural Ecology.** Analysis of practice, method, theory and history of this form of archaeological interpretation. Comparison with ecological research in other social and natural science disciplines. Prerequisite: approval of instructor. Credit, 3 hours.

**544 Settlement Patterns.** Analysis of spatial arrangement of residences, distribution and density over the landscape, and utilization of a given environment for habitation. Prerequisite: approval of instructor. Credit, 3 hours.

**545 Method and Theory of Archaeology.** Development of archaeology and the theoretical basis of the discipline. Rationale and methods of reconstruction of past human behavior from archaeological data. Prerequisite: approval of instructor. Credit, 3 hours.

**553 New World Physical Anthropology.** Human biology and variation of skeletal and living populations of Aleut-Eskimos and Indians. American Indian biological origins and micro-

evolution. Adaptation and human population biology problems. Field trip. Prerequisites: AN 341 and 342. Credit, 3 hours.

**554 Southwestern Physical Anthropology.** Human biology of skeletal and living populations of Indians of the Greater Southwest. Intensive review of within- and between-group variation. Field trip. Prerequisites: AN 341, 342, and one of the following: AN 221, 335, or 336. Credit, 3 hours.

**591 Seminar.** Credit, 2-3 hours. Prerequisite: approval of instructor. Topics may be selected from the following:

- (a) Physical Anthropology
- (b) Fossil Man
- (c) Microevolution of Human Populations
- (d) Primates and Behavior
- (e) Evolution and Culture
- (f) Dental Anthropology
- (g) Problems in Southwestern Archaeology
- (h) Synthesis in Archaeology
- (i) Early Man in the New World
- (j) Taxonomy in Archaeology
- (k) Cultural Anthropology
- (l) Social Anthropology
- (m) Problems in Southwestern Ethnology
- (n) Culture and Personality
- (o) Monographic Analysis
- (p) Linguistics
- (q) Museology

**Special Graduate Courses:** 500, 590, 591, 592, 593, 600, 690, 691, 692, 700, 791, 792, 799. (See pages 46-47.)

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## Biological Sciences

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### Bachelor of Science Degree Curriculum

**BIOLOGY** – A combined offering by the faculties of the Departments of Botany and Microbiology, and Zoology. This Liberal Arts major in biology is designed to serve students desiring a broader program in the biological sciences than that provided by the more specialized majors in the degree programs of the individual departments. The major consists of a minimum of 45 semester hours of credit, of which 18 must be in upper division courses. Required courses are BO 100; ZO 100; BI 340; MI 201, 202. The additional 30 hours in the major must reflect a balanced distribution of courses in the areas of physiology, ecology, morphology and systematics. Supporting courses required are CH 113, 115, 231 or 331, 332, 335, 336; PH 101 or 111, 112; MA 141; one year of an approved foreign language.

### Departmental Major Teaching Field Requirements

#### Bachelor of Arts in Education Degree Curriculum

**BIOLOGICAL SCIENCES** – A combined offering by the faculties of the departments in the Life Sciences. The major consists of a minimum of 42 semester hours of credit, of which 18 must be in upper division courses. Required courses are BO 100, 270; MI 201, 202; ZO 100; BI 320, 340; BO 360 or ZO 360; ZO 250 or ET 300. The total program must reflect a balanced distribution of courses from both departments. Supporting courses: One year

of general chemistry is required and organic chemistry is strongly recommended. BI 480 is required in the professional education program.

### Departmental Minor Teaching Field Requirements (Secondary Education)

**BIOLOGICAL SCIENCES** – Consists of 24 semester hours as follows: BO 100; ZO 100; MI 201, 202; BI 340 and 9 additional hours in courses listed under Biology, Botany, Entomology, Microbiology and Zoology, with the exception of the following: BI 100, 218, 318, 480; ZO 201, 202, and ZO 300. Supporting courses: BI 480 is required.

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## Botany and Microbiology

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#### Professors:

CANRIGHT (LSC 344), JOHNSON,  
REEVES

#### Associate Professors:

ARONSON, DYCUS, LEATHERS,  
NORTHEY, PATTEN

#### Assistant Professors:

PINKAVA, SCHMIDT, SOMMERFELD

#### Lecturer:

SWAFFORD

### Departmental Major Requirements

#### Bachelor of Science Degree Curriculum

**BOTANY** – Consists of a minimum of 45 semester hours of credit in botany and approved related fields, of which 18 must be in upper division courses. Required courses are BO 100, 270, 350, 360, 434 or 440; ZO 100;

BI 320, 340; MI 201, 202. Organic chemistry and one year of an approved foreign language are also required.

**MICROBIOLOGY** — Consists of 45 semester hours of credit, of which 18 must be in upper division courses. Required courses are MI 201, 202, 310, 420; ZO 100; BI 340; BO 100; CH 332; PH 111, 112; MA 141. In addition, one year of an approved foreign language is required.

**MEDICAL TECHNOLOGY** — Consists of 55 hours of approved courses in the pre-internship program selected by the advisor in consultation with the student, and one year of internship in an approved hospital program.

**X-RAY TECHNOLOGY** — Consists of 55 hours of approved courses in the pre-internship program selected by the advisor in consultation with the student, and 24 months internship in an approved hospital program.

### Departmental Graduate Programs

The Department of Botany and Microbiology offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

### BIOLOGY

**BI 100 The Living World.** Major biological principles as illustrated by the areas of behavior, biogeography, ecology, evolution, morphology, physiology, reproduction and development, and taxonomy. Does not meet science requirement in pre-professional curriculum. Not open to majors in the Biological Sciences. Three lectures, 2 hours laboratory. Credit, 4 hours.

**217 Biological Resource Management.** Environmental quality, its maintenance and

values, with special reference to renewable biological resources. Prerequisites: 8 hours of biological courses and approval of instructor. Credit, 3 hours.

**218 History of Medicine.** From Babylonian times through present medicine. For pre-medical and pre-dental students. Credit, 1 hour.

**310 Special Techniques in Biology.** Approval of instructor and chairman of department required. May be repeated for credit. Credit, 1-3 hours.

**318 The History of Biology.** Development of biological concepts from about 2000 B.C. through the present day. Prerequisite: 12 hours of biological sciences. Credit, 2 hours.

**320 Fundamentals of Ecology.** Basic concepts in ecology. Organization, functioning and development of ecological systems — energy flow, biogeochemical cycling, environmental relations, population dynamics. Prerequisites: BO 100; ZO 100, or approval of instructor. Credit, 3 hours.

**330 Ecology and Conservation.** Ecological and biological concepts of conservation; the use of basic and applied ecology to understand man-made ecological problems and the purpose of conservation. Credit, 3 hours.

**340 General Genetics.** Science of heredity and variation. Prerequisite: BI 100 or BO 100 or ZO 100 or equivalent. Credit, 3 hours.

**412 Biological Electron Microscopy.** Methods of preparation of biological materials for electron microscopic examination. Basic theory and use of the electron microscope. Prerequisite: approval of instructor. Two lectures, 6 hours laboratory. Credit, 4 hours.

**415 Biometry.** Statistical methods applied to biological problems, including design of experiments, estimation, tests of significance, analysis of variance, regression, correlation, chi square and bioassay. Prerequisite: MA 141 or equivalent. Two lectures, 6 hours laboratory. Credit, 4 hours.

**426 Limnology.** Dynamics of inland waters, stressing the interrelations of climatic, geological, topographical, physical and chemical factors with special reference to aquatic life. Prerequisites: BO 100; CH 113; ZO 250. Credit, 3 hours.

**427 Limnology Laboratory.** Three hours laboratory. Prerequisites: BI 426 or concurrent enrollment and approval of instructor. Credit, 1 hour.

**429 Advanced Limnology.** Study of recent literature, developments, methods and limnological theory; field and laboratory application to some particular topic in limnology. Prerequisite: BI 426. Credit, 3 hours.

**441 Cytogenetics.** Chromosomal basis of inheritance. Prerequisite: BI 340. Credit, 3 hours.

**442 Cytogenetics Laboratory.** Microscopic analysis of meiosis, mitosis and aberrant cell division. Prerequisite or concurrently: BI 441 and graduate status. Four hours laboratory. Credit, 2 hours.

**443 Physiological Genetics.** Nature and function of the gene. Prerequisites: BI 340; organic chemistry. Credit, 3 hours.

**445 Organic Evolution.** Principles and processes of evolution. Prerequisites: 12 hours of biological sciences, including BI 340 and a course in systematics. Credit, 3 hours.

**480 Methods of Teaching Biology.** Methods of instruction, experimentation, organization and presentation of appropriate content in biology. Prerequisites: SE 311 or concurrently and 20 hours in the biological sciences. Two lectures, 2 hours laboratory. Credit, 3 hours.

**520 Biology of the Desert.** Factors affecting plant and animal life in the desert regions and adaptations of the organisms to these factors. Prerequisites: 10 hours of biological sciences and/or approval of instructor. Credit, 2 hours.

**521 Biology of the Desert Laboratory.** Three laboratory hours. Prerequisites: BI 520 or concurrent enrollment and approval of instructor. Credit, 1 hour.

**BOTANY**

**BO 100 General Botany.** Principles of biology as illustrated by plants, including a brief survey of the plant kingdom. Three lectures, 3 hours laboratory. Credit, 4 hours.

**270 The Flora of Arizona.** Principles of taxonomy, identification of Arizona plants. Two lectures, 6 hours laboratory. Credit, 4 hours.

**301 Economic Botany.** Plants and plant products used by man throughout the world including their cultivation, processing and uses in modern life. Included are fibers, medicinals, beverages, perfumes, foods and other categories. Prerequisite: BI 100 or BO 100. Credit, 3 hours.

**350 Plant Anatomy.** Development and mature structure of the principal tissues of vascular plants, and the basic patterns and modifications of leaf, stem, root and flower. Prerequisite: BO 100. Three lectures, 3 hours laboratory. Credit 4 hours.

**360 Plant Physiology.** Plant growth and development, nutrition, water relations, reproduction, metabolism and photosynthesis. Prerequisites: BO 100; CH 231 or approval of instructor. Two lectures, 6 hours laboratory. Credit, 4 hours.

**420 Plant Ecology.** Plants in relation to environments. Prerequisite: BI 320 or equivalent. Three lectures, 3 hours laboratory or field trip. One weekend field trip. Credit, 4 hours.

**425 Plant Geography.** Plant communities of the world and their interpretation, emphasizing North American plant associations. Prerequisite: BO 100 or approval of instructor. Credit, 3 hours.

**434 General Mycology.** Various groups of fungi, emphasizing their morphology, identification procedures and economic significance. Prerequisites: BO 100 and/or MI 202. Two lectures, 6 hours laboratory. Credit, 4 hours.

**440 Morphology of the Non-Vascular Plants.** Morphology, life history and economic importance of the autotrophic cryptogams (algae

and bryophytes). Prerequisite: BO 100. Three lectures, 3 hours laboratory. Credit, 4 hours.

**445 Morphology of the Vascular Plants.** Comparative structure and evolutionary trends in the Tracheophyta. Prerequisites: BO 100, 350 or approval of instructor. Three lectures, 3 hours laboratory. Credit, 4 hours.

**450 Algae and Bryophytes.** Autotrophic cryptogams (algae, liverworts and mosses) emphasizing field collection and identification of local representatives. Prerequisites: BO 100, BI 100, or approval of instructor. Two lectures, 6 hours laboratory. Offered in summer only. Credit, 4 hours.

**455 Experimental Phycology.** Techniques employed in the isolation, identification, purification and culturing of freshwater and marine algae, emphasizing their use as experimental systems. Prerequisites: approval of instructor. Two lectures, 6 hours laboratory. Credit, 4 hours.

**460 Growth and Reproduction.** Interaction of environment, metabolic and hormonal factors in vegetative and reproductive phases of plant behavior. Prerequisite: CH 231. Two lectures, 6 hours laboratory. Credit, 4 hours.

**461 Physiology of Lower Plants.** Cellular physiology and biochemistry of algae and fungi; responses of these organisms to chemical and physical stimuli and their process of morphogenesis. Prerequisites: BO 100; CH 231. Credit, 3 hours.

**462 Physiology of Lower Plants Laboratory.** Techniques of cultivation and experimentation with selected algae and fungi. Prerequisites or corequisites: BO 461 and approval of instructor. Six hours laboratory. Credit, 2 hours.

**470 Taxonomy of Southwestern Vascular Plants.** Survey and identification of the vascular plants of the Southwest and the principles underlying their classification. Not open to students who have had BO 270. Three lectures, 6 hours laboratory. Two field trips. Summer only. Credit, 4 hours.

**475 Angiosperm Taxonomy.** Basic principles underlying angiosperm phylogeny. Prerequisite: BO 270 or approval of instructor. Two lectures, 2 hours laboratory. Credit, 3 hours.

**476 Experimental Plant Systematics.** Interpretation of taxa, utilizing cytological, genetic, ecological, morphological, and anatomical techniques and data. Prerequisite: BO 270 or 470, or approval of instructor. Two lectures, 3 hours laboratory. Credit, 3 hours.

**490 Paleobotany.** Plant life of the past, including types of plant fossils, kinds of fossilization, their geologic history and past geographic distribution. Methods of preparation of plant fossils for study; identification and interpretation of fossilized plant organs. Prerequisites: BO 100; GL 102 or approval of instructor. Three lectures, 3 hours laboratory or field trip. Credit, 4 hours.

**524 Environmental Analysis.** Theory and practice in measuring and interpreting macro- and micro-environmental data. Prerequisite: BO 420 or equivalent. Two lectures, 3 hours laboratory. Credit, 3 hours.

**526 Quantitative Plant Ecology.** Vegetation sampling and analysis, community ordination, and systems analysis in ecology. Prerequisites: BO 420 or equivalent. Two lectures, 3 hours laboratory. Credit, 3 hours.

**550 Palynology.** Consideration of the importance of spores and pollen (both fossil and modern) to systematics, evolution, ecology and stratigraphy. Prerequisite: approval of instructor. Credit, 2 hours.

**564 Plant Metabolism.** General plant metabolism and typical plant products, emphasizing biosynthesis and functions of storage products, cell wall constituents, plant acids, pigments, hormones and numerous secondary products; relationships between these substances and plant cell architecture. Prerequisites: CH 231; BO 360. Credit, 3 hours.

**591 Seminar.** Credit, 1-3 hours. Topics may be selected from the following:

- (a) Ecology

- (b) Biosystematics
- (c) Morphology
- (d) Plant Physiology
- (e) Mycology
- (f) Molecular Biology
- (g) Cacti and Succulents
- (h) Phycology

**Special Graduate Courses:** 590, 592, 593, 790, 792, 799 (See pages 46-47.)

### MICROBIOLOGY

**MI 105 Medical Technology Orientation.** Lecture and laboratory experience in various phases of clinical laboratory technology under hospital conditions. Open to medical technology majors only. Credit, 1 hour.

**201 Microbiology.** Bacteria, molds and other micro-organisms, and their application in industrial, agricultural, hygienic and domestic problems. Prerequisites: CH 113; BI 100 or equivalent. Credit, 3 hours.

**202 Microbiology Laboratory.** Principles and laboratory techniques used in identifying and handling micro-organisms. Prerequisite: MI 201 or concurrently. Three hours laboratory. Credit, 1 hour.

**310 Advanced Microbiology.** Comparative study of the systematic and pathogenic relationships of micro-organisms with a consideration of physiological activities of the micro-organisms involved. Prerequisites: MI 202; CH 231 and approval of instructor. Three lectures, 6 hours laboratory. Credit, 5 hours.

**334 Medical Mycology.** Fungi as causal agents of diseases of man, including pathology and epidemiology, emphasizing techniques of diagnosis. Prerequisite: MI 202 or equivalent. Two lectures, 3 hours laboratory. Credit, 3 hours.

**370 Instrumentation.** Basic electronics, basic instrumentation, and application. Two lectures, 4 hours laboratory. Credit, 3 hours.

**401 Medical Technology Laboratory Techniques and Theory.** Experience including

lecture and laboratory in the areas of hematology, clinical chemistry, microbiology and immunohematology. Credit, 16 hours.

**402 Medical Technology — Advanced Medical Laboratory Specialization.** Advanced lecture series and clinical laboratory experience including patient services. Specialization in one or more areas of clinical laboratory technology. Credit, 16 hours.

**420 Immunology.** Principles of immunity and their application to diagnosis, systematics and allergies. Prerequisites: MI 202; CH 231 or equivalent. Two lectures, 6 hours laboratory. Credit, 4 hours.

**440 Bacterial Genetics.** Mutation, molecular transfer mechanisms of hereditary material, and genetic recombination in bacteria and their viruses. Prerequisites: 8 hours of microbiology and BI 340. Two lectures, 3 hours laboratory. Credit, 3 hours.

**460 Bacterial Physiology.** Biochemical aspects of microbial growth and metabolism. Emphasizes enzymes of terminal oxidation, those especially involved in the synthesis and metabolism of cellular intermediates. Prerequisites: 8 hours of microbiology and CH 331 or equivalent. Two lectures, 3 hours laboratory. Credit, 3 hours.

**470 Systematic Bacteriology.** Classification and identification of bacteria. Prerequisites: MI 202, 8 hours of microbiology. One lecture, 6 hours laboratory. Credit, 3 hours.

**485 Virology.** Fundamental nature of viruses and other obligate intracellular parasites, their replication, pathogenesis, ecology and cultivation. Prerequisite: MI 202. Two lectures, 6 hours laboratory. Credit, 4 hours.

**518 Immunochemistry.** Chemistry of antigens and antibodies; chemical basis of immunity and resistance to disease. Prerequisites: MI 420; CH 464. Two lectures, 6 hours laboratory. Credit, 4 hours.

**560 Microbial Enzymology.** Oxidative and anaplerotic pathways of microbial metabolism. Function, synthesis, regulation, isolation and

assay of the key enzymes in these pathways. Prerequisite: MI 460. Two lectures, 6 hours laboratory. Credit, 4 hours.

**580 Pathogenic Bacteriology.** Etiology of bacterial disease. Pathology, diagnosis and epidemiology of human pathogenic bacteria. Prerequisites: MI 202; CH 231. Two lectures, 3 hours laboratory. Credit, 3 hours.

**591 Seminar.** Credit, 1-3 hours. Topics may be selected from the following:

- (a) Molecular Biology
- (b) Virology
- (c) Enzymology
- (d) Genetics
- (e) Immunology
- (f) Bacterial Ecology

**Special Graduate Courses:** 590, 592, 593, 790, 792 and 799 (See pages 46-47.)

## Chemistry

### Professors:

MOELLER (PS D-102d), D. BROWN, BURGoyNE, BURKE, CAUGHEY, EYRING, FUCHS, HARRIS, JUVET, LIU, LUCHSINGER, MOORE, MUNK, O'KEEFFE, PETTIT, SANDERSON, THOMSON, ZASLOW

### Associate Professors:

BIEBER, T. BROWN, BUSECK, LIN, STUTSMAN, WHITEHURST, WOODY, YUEN

### Assistant Professors:

P. BROWN, CRONIN, HOLLOWAY, NAVROTSKY, PARSONS

## Departmental Major Requirements

### Bachelor of Arts Degree Curriculum

CHEMISTRY — Consists of 45 semester hours of credit, of which 30 must be in chemistry and 15 in closely related fields. Required

courses are: CH 113, 115, 121, 225, 226, 331, 332, 335, 336, 341, 443 and 451. (As an alternative, a qualified student may elect to complete CH 117, 118, 119, 120, 317, 318, 319, 320, 417, 418, 419 and 420.) Related courses must include PH 111, 112 and MA 141, 142, or equivalent or more advanced courses. The remaining courses to complete the major will be determined by the student in consultation with his advisor.

### Bachelor of Science Degree Curriculum

**CHEMISTRY** – Consists of 42 semester hours of credit in chemistry. Required courses are: CH 117, 118, 119, 120, 317, 318, 319, 320, 417, 418, 419, 420, and six hours of research. In addition, PH 115, 116 (or 111, 112 if necessary); MA 120, 121, 212; and one year of German (or Russian) must be completed. The remaining chemistry courses to complete the major will be determined by the student in consultation with his advisor.

This curriculum is a new program. Transfer students will be interviewed and advised either to enter the new program or to break into the sequence of CH 113, 115, 121, 225, 226, 331, 332, 335, 336, 421, 422, 431, 441, 442, 444 and 453, according to their progress in equivalent courses.

*American Chemical Society Certification.* A student who satisfactorily completes the Bachelor of Science degree program will be certified by the Department of Chemistry to the American Chemical Society as having met the specific requirements for undergraduate professional training in chemistry.

### Departmental Major Teaching Field Requirements

#### Bachelor of Arts in Education Degree Curriculum

**CHEMISTRY** – **OPTION 1**, Consists of 42 semester hours of credit in chemistry and related fields. Required courses are: CH 113, 115, 121; 225, 226; 331, 332, 335, 336 (or 231, 361); 341 (or 441, 442); 451; 480 (or PL 480 or PH 480); PH 111, 112; and MA 141, 142. The remaining courses to complete the major will be determined by the student in consultation with his advisor.

**CHEMISTRY** – **OPTION 2**. Consists of 30 semester hours of chemistry, which includes all of the required chemistry courses listed in Option 1, and selection of the corresponding option in either mathematics or physics; that is, completion of an additional 30 semester hours in the chosen area as specified by the department selected.

### Departmental Minor Teaching Field Requirements (Secondary Education)

**CHEMISTRY** – Consists of 24 semester hours of credit in chemistry. Required courses are: CH 113, 115, 121; 225, 226; 231, 361 (or 331, 332, 335, 336); and 341. The remaining courses to complete the minor will be determined by the student in consultation with his advisor.

### Departmental Graduate Programs

The Department of Chemistry offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

### CHEMISTRY

**CH 101\* Introductory Chemistry.** Elements of general chemistry. Adapted to the needs of students in nursing, home economics, agriculture and physical education. Recommended for General Studies credit. Normally followed by CH 231. Three lectures, 1 quiz, 2 hours laboratory. Credit, 4 hours.

**113\* General Chemistry.** Principles of chemistry. Adapted to the needs of students in the physical, biological and earth sciences. Prerequisite: Three semesters of high school algebra or MA 116. One year of high school chemistry recommended. Three lectures, 1 quiz, 2 hours laboratory. Credit, 4 hours.

**114\* General Chemistry for Engineers.** One semester college chemistry with emphasis towards engineering. Prerequisites: Three semesters of high school algebra or MA 116; one year of high school chemistry. Three lectures, 1 quiz, 2 hours laboratory. Credit, 4 hours.

**115\* General Chemistry.** Continuation of CH 113. Equilibrium theory, chemistry of metals, nonmetals and metalloids, introduction to organic chemistry. Prerequisite: CH 113 or 2 years of high school chemistry. Corequisite: CH 116 or 121. Credit, 3 hours.

**116\* General Chemistry Laboratory.** Selected experiments to accompany CH 115 for students electing not to take qualitative analysis. Corequisite: CH 115. One quiz, 2 hours laboratory. Credit, 1 hour.

**117\*, 118\* Chemistry I, II.** Unified approach on chemical bonding, molecular structure, descriptive chemistry of the elements, properties of matter in various physical states, basic thermodynamics, chemical stoichiometry and chemical analysis. Prerequisites: Minimum of one year each of high school chemistry and physics, 3 years of high school mathematics. Corequisites: CH 119 for CH 117, CH 120 and MA 120 for CH 118. Credit, 3 hours each semester.

**119\*, 120\* Chemistry Laboratory I, II.** Preparation, purification, quantitative analysis and characterization of chemical compounds; solution chemistry and qualitative analysis involving inorganic and organic mixtures; introduction to instruments. Corequisites: CH 117 for CH 119, CH 118 for CH 120. One conference, 5 hours laboratory. Credit, 2 hours each semester.

**121\* Qualitative Analysis.** Qualitative separation and identification of common cations and anions. Corequisite: CH 115. Two quizzes, 4 hours laboratory. Credit, 2 hours.

**225\* Analytical Chemistry.** Principles and methods of chemical analysis. Primarily for students in agriculture, pre-medicine, pre-dentistry, and medical technology. Prerequisite: CH 115. Two lectures, 1 quiz. Credit, 2½ hours.

**226\* Analytical Chemistry Laboratory.** Experiments in chemical analysis. Corequisite: CH 225. Six hours laboratory. Credit, 1½ hours.

**231\* Elementary Organic Chemistry.** Representative groups of organic compounds, emphasizing biological applications. Adapted to the needs of students in nursing, home economics, agriculture and physical education. Prerequisite: CH 101 or 113; or approval of instructor; one year of high school chemistry with grade of A or B. Three lectures, 1 quiz, 2 hours laboratory. Credit, 4 hours.

**317\*, 318\* Chemistry III, IV.** Continuation of CH 117, 118. Reaction mechanisms and kinetics; systematic syntheses of chemical compounds. Prerequisites: CH 118 and 120. Corequisites for chemistry majors: CH 319 for CH 317, CH 320 for CH 318. Credit, 3 hours each semester.

**319\*, 320\* Chemistry Laboratory III, IV.** Chemical reactions and kinetics, emphasizing mechanisms and the identification and analysis of the products; use of instruments. Corequisites: CH 317 for CH 319, CH 318 for CH 320. One conference, 7 hours laboratory. Credit, 2 hours each semester.

**331\*, 332\* General Organic Chemistry.** Chemistry of organic compounds. Prerequisite: CH 115 or 118. Credit, 3 hours each semester.

**335\*, 336\* General Organic Chemistry Laboratory.** Organic chemical experiments in separation techniques, synthesis, analysis and identification, and relative reactivity. Corequisites: CH 331 for CH 335, CH 332 for CH 336. Four hours laboratory. Credit, 1 hour each semester.

**341\* Elementary Physical Chemistry.** Properties of solids, liquids, gases, solutions, equilibrium, colloidal state. For pre-medical, biology, agriculture, etc., students. Prerequisites: CH 118 or 225 and CH 231 or 331 and MA 142. Credit, 3 hours.

**361\* Elementary Biochemistry.** Chemistry of animal and plant life including biological compounds, tissues, foods and digestion, enzymes, etc. Prerequisite: CH 231, 318 or 332. Credit, 3 hours.

**367 Elementary Biochemistry Laboratory.** Experiments include qualitative and quantitative analysis of major biological constituents such as carbohydrates, lipids, nucleic acids and proteins, and measurement of enzyme activity. Corequisite: CH 361 or approval of instructor. Three hours laboratory. Credit, 1 hour.

**392 Introduction to Research Techniques.** Instrumental methods and philosophy of research by actual participation in chemical research projects. Prerequisite: approval of advisor and research supervisor. Credit, 1 to 3 hours each semester; may be repeated for credit; total may not exceed 6 hours.

**417\*, 418\* Chemistry V, VI.** Continuation of CH 317, 318. Advanced physical chemical concepts; advanced principles in chemical analysis; selected topics in chemistry. Prerequisites: CH 318, PH 116 and MA 212. Corequisites for chemistry majors: CH 419 for CH 417, CH 420 for CH 418. Credit, 3 hours each semester.

**419\*, 420\* Chemistry Laboratory V, VI.**

Selected experiments emphasizing physical chemical measurements; special projects. Corequisites: CH 417 for CH 419, CH 418 for CH 420. One conference, 5 hours laboratory. Credit, 2 hours each semester.

**421 Instrumental Analysis.** Principles of instrumental methods in chemical analysis. Electroanalytical and optical techniques. Prerequisites: CH 225 and 226. Corequisite: CH 418 or 442. Credit, 3 hours.

**422 Instrumental Analysis Laboratory.** Experiments in chemical analysis by electroanalytical and optical techniques. Corequisite: CH 421. Three hours laboratory. Credit, 1 hour.

**431 Qualitative Organic Analysis.** Systematic identification of organic compounds. Prerequisites: CH 120 or 226 and CH 320 or 336, or approval of instructor. One lecture, 6 hours laboratory. Credit, 3 hours.

**435 Organic Laboratory Methods.** Methods of organic synthesis. General types of organic reactions and laboratory techniques employed in preparation, isolation and purification of complex organic products. Prerequisite: CH 431 or approval of instructor. One lecture, 1 conference, 5 hours laboratory. Credit, 3 hours.

**441\*, 442\* General Physical Chemistry.** Gases, liquids, solids, solutions, equilibrium, phase rule, electrochemistry, thermodynamics, atomic structure, radioactivity and colloids. Prerequisites: PH 112 or 116 or ES 231; MA 212. Credit, 3 hours each semester.

**443\* Physical Chemistry Laboratory.** Physical chemical experiments. Corequisite: CH 341 or 441. Three hours laboratory. Credit, 1 hour.

**444\* General Physical Chemistry Laboratory.** Physical chemical experiments. Prerequisite: CH 441. One conference, 5 hours laboratory. Credit, 2 hours.

**446\* Radioisotope Techniques.** Radioactivity and detection of nuclear radiations. Quantitative measurements, tracer techniques and methods used in agriculture, medicine, industrial radiochemistry and related fields. For persons majoring in fields other than

chemistry. Prerequisite: CH 118 or 225. Two lectures, 3 hours laboratory. Credit, 3 hours.

**447\* Radiochemistry.** Radioactivity, natural and artificial radioisotopes, nuclear reactions, isolation of isotopes, nuclear energetics, measurement of radioactivity, tracer techniques and other applications. Corequisite: CH 441. Credit, 2 hours.

**448\* Radiochemistry Laboratory.** Radiation measurements, tracer methods, quantitative identification of isotopes, and other procedures applicable to chemical, physical, engineering and biological problems. Corequisite: CH 447. One conference, 4 hours laboratory. Credit, 2 hours.

**451\* Inorganic Chemistry.** Atomic structure, periodic relationships, chemical bonding, nomenclature, aqueous and nonaqueous chemistry. Prerequisite: CH 118 or 225. Credit, 3 hours.

**452 Inorganic Chemistry Laboratory.** Preparation and purification of typical inorganic substances emphasizing methods and techniques. Prerequisite: approval of instructor. One lecture, 3 hours laboratory. Credit, 2 hours.

**453\* Inorganic Chemistry.** Principles and applications of inorganic chemistry. Corequisite: CH 418 or 442. Credit, 3 hours.

**458 Solid State Chemistry.** Crystal chemistry, thermodynamics and electrochemistry of solids, nonstoichiometric compounds, diffusion and solid state reactions, crystal growth and selected topics. Prerequisite: CH 417 or 441, or approval of instructor. Credit, 3 hours.

**461\*, 462 General Biochemistry.** Fundamental chemistry and metabolism of major biological materials and their role in the biochemical processes of living organisms. Prerequisites: CH 318 or 332 and CH 341 or 417 or 441. Credit, 3 hours each semester.

**467, 468 General Biochemistry Laboratory.** Chemistry of biological compounds, emphasizing metabolic transformations of proteins, carbohydrates and fats. Corequisites: CH 461

with 467; 462 with 468. One conference, 5 hours laboratory. Credit, 2 hours each semester.

**480 Methods of Teaching Chemistry.** Organization and presentation of appropriate content of chemistry; preparation of reagents, experiments, demonstrations; organization of stock rooms, laboratories; experience in problem solving. Prerequisite: approval of instructor. Credit, 3 hours.

**481 Geochemistry.** Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere. Prerequisite: CH 341 or 417 or 441 or GL 321. Credit, 3 hours. (Same as GL 481).

**482 Physical Geochemistry.** Applications of thermodynamic and kinetic principles to geochemical processes. Prerequisite: CH 341 or 417 or 441 or GL 481. Credit, 3 hours. (Same as GL 482).

**485 Meteorites and Cosmochemistry.** Chemistry and mineralogy of meteorites and their relationship to the origin of the earth, solar system and universe. Prerequisite: CH 481 or 482. Credit, 3 hours. (Same as GL 485).

**501 Current Topics in Chemistry.** Prerequisite: approval of instructor. May be repeated for credit. Credit, 1 hour.

**511, 512 Chemistry for In-service Teachers.** An integrated approach to the concepts and principles of chemistry. Prerequisite: approval of instructor. Credit, 3 hours each semester.

**523 Advanced Analytical Chemistry.** Theoretical principles of analytical chemistry. Prerequisites: CH 225 and 418 or 442, or their equivalents. Credit, 3 hours.

**525 Spectrochemical Methods of Analysis.** Theoretical and practical considerations involving the use of optical instruments for chemical analysis, emphasizing emission and absorption spectroscopy. Prerequisite: CH 418 or 442. Three lectures, 3 hours laboratory. Credit, 4 hours.

**526 X-ray Methods of Analysis.** Theoretical and practical considerations involving the use of X-ray diffraction and spectroscopy for chemical and structural analyses. Prerequisite: CH 418 or 442. Three lectures, 3 hours laboratory. Credit, 4 hours.

**527 Electrical Methods of Chemical Analysis.** Theoretical and practical considerations of polarography; potentiometric, amperometric, and conductometric titrations. Prerequisite: CH 418 or 442. Two lectures, 6 hours laboratory. Credit, 4 hours.

**528 Topics in Analytical Chemistry.** Prerequisites: CH 523 and approval of instructor. May include laboratory. May be repeated for credit. Credit, 2 to 4 hours.

**531 Theoretical Organic Chemistry.** Reaction mechanisms, structure elucidation, stereoisomerism, conformational analysis. Prerequisites: CH 318 or 332 and 418 or 442. Credit, 3 hours.

**532 Theoretical Organic Chemistry.** Prerequisite: CH 531. Credit, 2 hours.

**534 Heterocyclic Compounds.** Chemistry of organic heterocyclic compounds containing nitrogen, sulfur, and other hetero atoms. Prerequisites: CH 532, 537. Credit, 2 hours.

**535 Carbohydrates.** Prerequisites: CH 532, 537, or approval of instructor. Credit, 2 hours.

**536 Natural Products.** Organic chemistry of such natural products as alkaloids, steroids, terpenes, organic medicinals and antibiotics. Prerequisites: CH 532, 537 and approval of instructor. May be repeated for credit. Credit, 2 hours.

**537 Organic Reactions.** Important synthetic reactions of organic chemistry emphasizing recently discovered reactions of preparative value. Prerequisite: CH 531. Credit, 2 hours.

**538 Polymers.** Chemistry and properties of natural and synthetic polymers. Prerequisite: CH 318 or 332. Credit, 2 hours.

**541 Advanced Principles of Chemistry, I.** Thermodynamics and kinetics as applied to

various areas of chemistry. Prerequisite: CH 418 or 442. Credit, 3 hours.

**542, 543 Statistical Thermodynamics.** Statistical mechanics applied to chemical problems. Prerequisite: CH 541. Credit, 3 hours each semester.

**545 Advanced Principles of Chemistry, II.** Basic quantum theory, chemical bonding and molecular structure. Prerequisite: CH 541, or approval of instructor. Credit, 3 hours.

**546, 547 Quantum Chemistry.** Principles of quantum mechanics applied quantitatively to problems of chemical interest. Prerequisite: approval of instructor. Credit, 3 hours each semester.

**548 Chemical Kinetics.** Kinetic theory and rate processes. Prerequisite: approval of instructor. Credit, 2 hours.

**549 Topics in Physical Chemistry.** Prerequisite: approval of instructor. May be repeated for credit. Credit, 3 hours.

**553 Inorganic Chemistry.** Principles of modern inorganic chemistry and their applications over the entire periodic system. Prerequisites: CH 418 or 442 and 453, or equivalents. Credit, 3 hours.

**554 Advanced Inorganic Chemistry.** Elaboration and extension of the more important topics of CH 553. Prerequisite: CH 553. Credit, 3 hours.

**556 Topics in Inorganic Chemistry.** Prerequisites: CH 553 and approval of instructor. May be repeated for credit. Credit, 3 hours.

**563 Biophysical Chemistry.** Physical chemistry of macromolecules, especially proteins, nucleic acids and polysaccharides. Thermodynamics, hydrodynamics, and spectroscopy of biopolymers and their relation to structure. Prerequisite: CH 462 or 418 or 442. Credit, 3 hours.

**565 Biochemical Techniques.** Application of modern techniques of isolation and analysis to biochemical materials and processes. Ordinarily includes laboratory. Prerequisite:

approval of instructor. May be repeated for credit. Credit, 1 to 3 hours.

**581 Isotope Geochemistry.** Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Prerequisite: approval of instructor. Credit, 3 hours. (Same as GL 581).

**582 Topics in Geochemistry and Cosmochemistry.** Topics of current interest for students in chemistry and other fields. Sampling of data and thought concerning phase equilibria, element distribution, meteorites, the earth and other planets. Prerequisite: approval of instructor. May be repeated for credit. Credit, 3 hours. (Same as GL 582).

**583 Phase Equilibria and Geochemical Systems.** Study of natural reactions at high temperatures and pressures; silicate, sulfide and oxide equilibria. Prerequisite: CH 482. Credit, 3 hours. (Same as GL 583).

**Special Graduate Courses:** 590, 591, 592, 593, 790, 792, 799. (See pages 46-47.)

*\*In each of the following groups, credit is allowed for one course only:* CH 101, 113 or 117; CH 114, 115 or 118; CH 116 or 119; CH 118 or 225; CH 120 or 121; CH 120 or 226; CH 231, 317 or 331; CH 318 or 332; CH 319 or 335; CH 320 or 336; CH 341, 417 or 441; CH 361 or 461; CH 418 or 442; CH 419, 443 or 444; CH 420 or 444; CH 446 or 447; CH 446 or 448; CH 451 or 453.

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## English

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### Professors:

FERRELL (LL 501), ARCHER, ERNO, FISHER, LAMBERTS, LEVY, MYERS, O'MALLEY, OSENBURG, SALERNO, SHAFER, TURNER

### Associate Professors:

DOEBLER, DONELSON, ELLIS, EMERY, EVANS, HABERMAN, HERMAN, KEHL, LIGHTFOOT, MURRAY, NEY, POWERS, RATLIFF

### Assistant Professors:

BAROODY, BROSE, BUCKINGHAM, COLBY, D'ANGELO, J. GREEN, M. GREEN, GREENE, HAKAC, JANSSEN, JOHNSON, MORAN, NEBEKER, QUICK, QUIRK, RANDALL, SLATTERY, SWANSON

### Instructors:

BALDWIN, BIGGERSTAFF, BLUMER, BRIA, BUCKNOR-SMARTT, CLEMENTS, COATES, CROOKS, FULLER, HARRIS, HAWKEY, HOLSINGER, HUTCHISON, JOHNSON, LIGHTFOOT, LINDELL, MATTE, MONTAGUE, REDWINE, SEAVY, SCHIEDAT, WAGNER, ZAUN

## Departmental Major Requirements

### Bachelor of Arts Degree Curriculum

ENGLISH – Consists of 45 semester hours of credit, of which 30 must be in English, and 15 in no more than two related fields (drama, speech, history, psychology, etc.) to be selected by the student in consultation with the advisor. Required courses are EN 221 and 222; 421 or 422; 423 or 424; 312 or 314 or 413; two period courses (e.g., 341, 415, 419); one types course (e.g., 420, 446, 452). At least 18 hours must be in upper division courses.

## Departmental Major Teaching Field Requirements

### Bachelor of Arts in Education Degree Curriculum

ENGLISH — Consists of 42 semester hours of credit in English. Required courses are EN 211 or 212, 221, 222, 312 or 314 or 413, 341 or 342, 421 or 422, 471, 480, one literary types course, one period course, and 12 hours electives, six of which must be upper division. Upper division courses in related fields may be elected with the approval of the advisor.

### Departmental Minor Teaching Field Requirements (Secondary Education)

ENGLISH — Consists of 24 semester hours of credit. Required courses are EN 211 or 212; 221 or 222; 341 or 342; 312 or 314; 471 or 480; and additional electives in English, with at least one elective in literature, as approved by the advisor.

### Departmental Graduate Programs

The Department of English offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

**EN 101 First Year English.** Composition; emphasis on paragraph structure, correctness in English fundamentals, exactness and concreteness of statement; dictionary and library practice; intensive and extensive reading. Credit, 3 hours.

**102 First Year English.** Expository writing; emphasis on organizing and unifying long papers, improvement in style, expansion of vocabulary. Introduction to word study; practice in research, including the writing of a model term paper. Intensive and extensive reading. Prerequisite: EN 101. Credit, 3 hours.

**103 Introduction to Literature.** Introduction to literature through literary types, selections taken mainly from modern writers. Not open to English majors. Credit, 3 hours.

**104 Advanced First Year English.** Composition, emphasizing refining writing skills; intensive reading; research papers; logic. Prerequisite: passing grade on the EN 101 exemption examination. Credit, 3 hours.

**105 The Nature of Literature.** A critical approach to literary types: poetry, drama, essay, short story, novel. For English majors or minors, primarily for freshmen, but open to sophomores. Credit, 3 hours.

**111 English for Foreign Students.** For students from non-English speaking countries who have studied English in their native countries, but who require practice in the idioms of English. Intensive reading, writing and discussion to acquaint students with the colloquial flavor of English. Satisfies the graduation requirement of EN 101. Credit, 3 hours.

**112 English for Foreign Students.** Reading on a broader scope and more emphasis on composition. Satisfies the graduation requirement of EN 102. Prerequisite: EN 111. Credit, 3 hours.

**201 World Literature — The Classical and Medieval Periods.** Selections from the great literature of the world in translation and lectures on the cultural background of the writings. Prerequisite: EN 101. Credit, 3 hours.

**202 World Literature — The Renaissance and Modern Periods.** Selections from the great literature of the world in translation and lectures on the cultural background of the writings. Prerequisite: EN 101. Credit, 3 hours.

**204 Literature of Today.** Poetry, short story, novel and drama. Not for English majors. Not open to freshmen. Credit, 3 hours.

**211 Advanced Composition.** For students interested in further training in organization and expression of ideas. Primarily for non-English majors. Prerequisite: EN 102. Two lectures, conferences arranged. Credit, 3 hours.

**212 English Prose Style.** Advanced training in various types of prose writing. Prerequisites: Grade of "B" in EN 102; English major or approval of instructor. Two lectures, conferences arranged. Credit, 3 hours.

**221 Survey of English Literature.** Content and form of earlier English literature, including individual and national characteristics of certain authors. Prerequisite: EN 102. Primarily for English majors and minors. Credit, 3 hours.

**222 Survey of English Literature.** Based upon the later English literature. Prerequisite: EN 102. Primarily for English majors and minors. Credit, 3 hours.

**300 History of Literary Criticism.** Major critical theories and methods from the Classical Period to the 20th Century. Prerequisite: junior standing or approval of instructor. Credit, 3 hours.

**311 Creative Writing.** Writing laboratory. Lectures and conferences dealing with the various forms of imaginative writing. Prerequisites: EN 211 or 212, and approval of instructor. Two lectures, conferences arranged. Credit, 3 hours.

**312 Current English Usage.** Recent changes and current trends in the language, emphasizing American English and the factual basis of grammar. Prerequisite: junior standing or approval of instructor. Credit, 3 hours.

**314 Modern Grammar.** Conventional, structural and generative grammars with implications for high school English teachers. Prerequisite: junior standing or approval of instructor. Credit, 3 hours.

**321 Introduction to Shakespeare.** Shakespeare's major comedies, histories and tragedies. Not open to English majors. Prerequisite: junior standing or approval of instructor. Credit, 3 hours.

**341 American Literature.** From colonial times to the Civil War, including the growth of nationalism and the rise of the New England school. Open to those specializing in other

departments who have junior standing. Prerequisite: EN 102. Credit, 3 hours.

**342 American Literature.** From Whitman to the present. Influence of westward expansion, growth of regionalism, literature of social protest and post-World War II writing. Open to those specializing in other departments who have junior standing. Prerequisite: EN 102. Credit, 3 hours.

**352 Short Story.** Development of the short story as a literary form; analysis of its technique from the work of representative authors. Prerequisite: 3 hours of literature. Credit, 3 hours.

**355 History of the Drama.** English drama from the Middle Ages to the present, with selective examples of foreign influences. Reading of representative plays of each period. Prerequisite: junior standing or approval of instructor. Credit, 3 hours.

**356 Biblical Backgrounds of Literature.** Reading of the Old and New Testaments, emphasizing types and ideas used as primary or major sources in literature. Prerequisite: junior standing or approval of instructor. Credit, 3 hours.

**358 Afro-American Literature.** Thematic and cultural study of the literature dealing with the Afro-American in the U. S. Prerequisite: EN 102. Credit, 3 hours.

**360 History and Art of the Film.** Development of the film as an art form. Consideration of those techniques which the film shares with the other arts, and those which are unique to it. For general studies credit only. Lecture and laboratory. Credit, 3 hours.

**400 Contemporary Literary Criticism.** Twentieth century critical theories and methods. Practice in criticism of poetry, drama, short story and the novel. Prerequisite: senior or graduate standing. Credit, 3 hours.

**411 Advanced Creative Writing.** Prerequisite: EN 311 or approval of instructor. Two lectures, conferences arranged. Credit, 3 hours.

**412 Professional Writing.** Lectures and conferences concerning techniques of writing for publication. Prerequisite: EN 311 or approval of instructor. Two lectures, conferences arranged. Credit, 3 hours.

**413 History of the English Language.** Development of the language from the earliest times to the modern period. Prerequisite: EN 221. Credit, 3 hours.

**415 Medieval Literature.** Medieval English literature in translation, from Beowulf to Malory (exclusive of Chaucer), emphasizing cultural and intellectual backgrounds, and including some continental works. Prerequisite: 3 hours of literature. Credit, 3 hours.

**418 Tudor Literature.** English prose and poetry, 1485-1603, exclusive of the drama. Prerequisite: EN 221. Credit, 3 hours.

**419 The Age of Donne.** English prose and poetry, 1603-1660, exclusive of Milton and the drama. Prerequisite: EN 221. Credit, 3 hours.

**420 Renaissance Drama.** Plays of Elizabethan, Jacobean and Caroline dramatists, excluding Shakespeare. Prerequisite: EN 221 or TH 111. Credit, 3 hours.

**421 Shakespeare: The Early Plays.** Critical reading of the comedies, early tragedies and selected history plays (1593-1602). Prerequisite: EN 221. Credit, 3 hours.

**422 Shakespeare: The Later Plays.** Critical reading of the mature tragedies, later comedies and romances. Prerequisite: EN 221. Credit, 3 hours.

**423 Milton.** Life of Milton — his relation to the literary and social background of his period, and textual study of his chief works. Prerequisite: EN 221. Credit, 3 hours.

**424 Chaucer.** Chaucer's language, poetry and intellectual background. Prerequisite: EN 221. Credit, 3 hours.

**425 Romantic Poetry.** Poetry of Wordsworth, Coleridge, Shelley, Keats, Byron. Prerequisite: EN 222. Credit, 3 hours.

**426 Victorian Poetry.** Poetry of the second

half of the century. Special study of Tennyson, Browning, Arnold. Prerequisite: EN 222. Credit, 3 hours.

**427 Age of Johnson.** Chief writers, movements and books during Johnson's career as a dominating literary figure, together with their most important relationships to predecessors and followers. Prerequisite: EN 221. Credit, 3 hours.

**428 Age of Dryden and Pope.** Chief writers and movements in the nondramatic literature of the Restoration and early 18th century. Prerequisite: EN 221. Credit, 3 hours.

**430 19th Century Prose.** Romantic and Victorian prose, exclusive of the novel. Prerequisite: EN 222. Credit, 3 hours.

**435 19th Century American Poetry.** Themes and developments in American poetry to 1900. Prerequisite: junior standing, or approval of instructor. Credit, 3 hours.

**439 Drama from Dryden to Sheridan.** English drama of the Restoration and 18th century, especially critical theories and social forces affecting the stage. Prerequisite: EN 221 or TH 465. Credit, 3 hours.

**441 20th Century American Drama.** American drama since World War I, especially experimental techniques. Prerequisite: 3 hours of literature. Credit, 3 hours.

**442 20th Century British Poetry.** Major British poets of the period: techniques, aims and significance. Prerequisite: 3 hours of literature. Credit, 3 hours.

**443 20th Century American Poetry.** Major American poets of the period: techniques, aims and significance. Prerequisite: 3 hours of literature. Credit, 3 hours.

**444 American Romanticism, 1830-60.** Art and ideas of major American transcendentalists and romantics. Prerequisite: EN 341. Credit, 3 hours.

**445 American Realism, 1860-1900.** Writers and influences that shaped the development

of literary realism. Prerequisite: EN 341 or 342. Credit, 3 hours.

**446 The American Novel from Dreiser to 1945.** Major American novelists of the period: developments in theory and practice. Prerequisite: 3 hours of literature. Credit, 3 hours.

**448 20th Century British Novel.** Twentieth century British novel since 1914. Prerequisite: three hours of literature. Credit, 3 hours.

**451 The Novel to Jane Austen.** From the origins of prose fiction through Scott. Prerequisite: EN 221. Credit, 3 hours.

**452 The 19th Century Novel.** From Scott to Conrad. Prerequisite: EN 222. Credit, 3 hours.

**453 The American Novel to Dreiser.** Sentimental, romantic realistic and naturalistic novels in America. Prerequisite: EN 341 or 342. Credit, 3 hours.

**454 Modern Drama.** Chief dramatic writers of the modern period, emphasizing experimental techniques. Prerequisite: 3 hours of literature. Credit, 3 hours.

**455 The Form of Verse: Theory and Practice.** Types, history, criticism and schools of theory of metrical form. Analysis of lyric narrative and dramatic poetry. Original verse writing optional. Prerequisite: 3 hours of literature. Two lectures, conferences arranged. Credit, 3 hours.

**456 Classical Backgrounds of English Literature.** Myths and legends of Greece and Rome and some of the works in which they appear. Prerequisite: junior standing or approval of instructor. Credit, 3 hours.

**458 American Novel Since 1945.** Major novelists of the period: developments in theory and practice. Prerequisite: 3 hours of literature. Credit, 3 hours.

**460 Western American Literature.** Critical examination of ideas and traditions of the literature of the western United States, including the novel. Prerequisite: junior standing or approval of the instructor. Credit, 3 hours.

**471 Literature for Junior and Senior High**

**School Students.** Prose and poetry which meet the interests, desires and capabilities of the high school boy and girl. Recent literature stressed. Credit, 3 hours.

**480 Methods of Teaching English.** Methods of instruction, organization and presentation of appropriate content in English. Prerequisite: EN 312 or 314 or 413. Credit, 3 hours.

**485 Teaching of English as a Second Language.** Teaching of English to young persons and adults whose native language is not English. Nature of language learning, testing, analysis of differences between two languages as a basis of instruction. Problems of cultural orientation. Prerequisite: EN 312 or 314 or 413, and teaching experience or approval of the instructor. Credit, 3 hours.

**491 Backgrounds of English Literature.** Lectures and individual study in England, France and Italy. Tour to be arranged. Credit, 3-6 hours.

**500 Research Methods.** Credit, 3 hours.

**505 American English.** Development of the English language in America including a survey of geographical and social dialects. Credit, 3 hours.

**507 Old English.** Elements of Old English grammar, with selected readings. Credit, 3 hours.

**508 Beowulf.** Intensive literary and linguistic study of Beowulf. Prerequisite: EN 507. Credit, 3 hours.

**509 Middle English Language.** A study of the language, including the principal dialects, with selected readings. Credit, 3 hours.

**510 The Structure of English.** Grammatical patterns of English, particularly current linguistic approaches. Prerequisite: EN 314 or 413 or approval of instructor. Credit, 3 hours.

**512 The Teaching of Composition in the Secondary School.** Advanced intensive study of rhetoric and linguistic materials appropriate for the teaching of composition, and their application to the development of new school

programs. Prerequisite: EN 480 or equivalent or approval of instructor. Credit, 3 hours.

**515 Middle English Literature.** English literature from the 12th through the 15th century, exclusive of Chaucer. Credit, 3 hours.

**520 Renaissance Literature.** Poetry and prose of the English Renaissance, excluding drama. Prerequisite: EN 221. Credit, 3 hours.

**540 American Literature to 1815.** Thought and expression from the time of the first English-speaking colonies to 1815. Prerequisite: EN 341 or approval of department chairman. Credit, 3 hours.

**545 Studies in English Literature.** Intensive study of selected authors or issues. May be repeated for credit. Credit, 3 hours.

**547 Studies in American Literature.** Intensive study of selected authors or issues. May be repeated for credit. Credit, 3 hours.

**550 Contemporary Comparative Literature.** Current trends in American and other literatures emphasizing their significance in contemporary thought. Credit, 3 hours.

**571 The Teaching of Literature in the Secondary School.** Advanced methods and materials appropriate for teaching literature. Application of recent literary scholarship and criticism to the development of new school programs. Prerequisite: EN 471 or equivalent or approval of instructor. Credit, 3 hours.

**572. The Teaching of Language in the Secondary School.** Methods and materials appropriate for teaching the English language in the secondary school. Application of recent scholarship and research in linguistics and applied linguistics to the development of new school programs. Prerequisite: EN 312, 314, or 413, and teaching experience or approval of the instructor. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Selected topics regularly offered in the various areas of English studies.

**Special Graduate Courses:** 500, 590, 591, 592, 593, 600, 690, 691, 692, 700, 790, 791,

792, 799. (See page 46.) Prerequisites for EN 590, 690 and 790: approval of instructor, advisor, and department chairman. Secure forms in the Department of English office.

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## Foreign Languages

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### Professors:

SHEPPARD (LL 403), BOWMAN, BUFFINGTON, ESCUDERO, GROBE, LOWE, MARTINEZ, VAN SCOY, VON DER HEYDT, WIRTZ

### Associate Professors:

BININGER, CARLSON, COUCH, EKMANIS, FOSTER, KNOWLTON, LANDEIRA, LUENOW, MCINTIRE, RADKE, VIRGILLO

### Assistant Professors:

ACEVEDO, CARVER, CURRAN, HARRISON, LAETZ, LAWYER, MACKEY, NIELSON, SIMMONS, TIPTON, WOLLAM

### Instructors:

ABDOW, ALARCÓN, KRYLOVA, SCHUBACK, WILSON

## Departmental Major Requirements

### Bachelor of Arts Degree Curriculum

CHINESE, FRENCH, GERMAN, RUSSIAN, SPANISH – Consists of 45 semester hours of credit, of which 30 must be in one language, and 15 in closely related fields to be approved by the advisor in consultation with the student. The 30 hours must be above the 102 level and include the 321, 322 courses. At least 18 semester hours must be in upper division courses.

ASIAN STUDIES EMPHASIS – Consists of the Bachelor of Arts Degree requirements in Chinese. At least 30 semester hours of the student's program must consist of Asian courses selected with approval of the depart-

ment advisor. Basic Chinese and Japanese language courses may not be counted within this total.

LATIN AMERICAN STUDIES EMPHASIS – Consists of 45 semester hours of credit of which 30 must be in Spanish. In addition, 15 hours of Latin American content courses as related fields must be completed. Fulfillment of requirements is recognized by a bachelor's degree with a major in Spanish-Latin American Studies.

## Departmental Major Teaching Field Requirements

### Bachelor of Arts in Education Degree Curriculum

CHINESE, FRENCH, GERMAN, RUSSIAN, SPANISH – Consists of 45 semester hours of credit, of which 30 must be in one language, and 15 in closely related fields to be approved by the advisor in consultation with the student. The 30 hours must be above the 102 level and include the 321, 322 courses.

## Departmental Minor Teaching Field Requirements (Secondary Education)

Consists of a minimum of 18 semester hours of credit in one foreign language, not including 101 and 102 courses. The minor ordinarily consists of 201-202, 311-312, and additional courses at the 300 and 400 level.

## Departmental Graduate Programs

The Department of Foreign Languages offers programs leading to the degree of Master of Arts in French, German and Spanish and the Doctor of Philosophy degree in Spanish. Consult the *Graduate Catalog* for requirements.

## Placement

Students who have high school credit in a foreign language and who plan to continue study here in the same language must take the departmental placement examination as a prerequisite to enrollment in such language courses. The examination should be taken immediately prior to the semester in which university study is begun. This examination will be offered during registration week before the fall and spring semesters. Those who wish to start their language study during the summer sessions are required to consult with a member of the departmental placement committee before registering for a language course.

For the purpose of pre-placement advisement, one year of high school language may be equated to one semester of university study. College transfers are not required to take the placement examination.

## Language Laboratory Requirement

All students enrolled in 101, 102, 201, and 202 language courses must spend a minimum of one hour per week in the language laboratory in addition to the four regular class periods.

## FOREIGN LANGUAGES

**FL 400 Linguistics.** Surveys major theories of current linguistic study and explores their application to specific issues of English, the Romance Languages, and language teaching. Open to sophomores and juniors with approval of instructor. Credit, 3 hours.

**421 Directed Reading for Foreign Languages Majors.** Supervised reading with a weekly individual conference with instructor. Prerequisite: six hours in upper division courses. Credit, 2 hours.

**480 Methods of Teaching Foreign Languages.**

Teaching foreign languages and literatures at secondary and college levels. Student participation in classroom demonstrations. Observation of classroom teaching techniques. Required for admission to SE 433. Prerequisite: 12 hours of upper division courses in one foreign language. Credit, 3 hours.

**500 Research Methods.** Required of all graduate students. Credit, 3 hours.

**CHINESE**

**CN 101, 102 Elementary Chinese (Mandarin).** Pronunciation, grammar, elementary conversation, development of basic reading and writing skills. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**201, 202 Intermediate Chinese (Mandarin).** Systematic review of grammar. Development of vocabulary through reading, writing. Drill in aural/oral skills. Prerequisite: CN 102 or equivalent. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**311, 312 Advanced Chinese Conversation.** Intensive aural/oral drills towards conversational fluency in Mandarin Chinese. Instruction in Mandarin Chinese. Prerequisite: CN 202. Credit, 2 hours each semester.

**313, 314 Advanced Chinese.** Emphasis on the modern written language. Prerequisite: CN 202 or equivalent. Credit, 3 hours each semester.

**321, 322 Introduction to Chinese Literature in Translation.** Knowledge of Chinese not required. Broad view of Chinese literary development; selected representative works of the various genres and periods. Credit, 3 hours each semester.

**413, 414 Introduction to Literary Chinese.** Readings in various genres of pre-20th century, wen-yen, with analysis of its structural characteristics. Prerequisite: CN 314. Credit, 3 hours each semester.

**FRENCH**

**FR 101, 102 Elementary French.** Intensive aural/oral drill in class and laboratory, and a study of basic grammar supplemented by simple prose readings. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**201, 202 Intermediate French.** Continued oral practice, grammar review, readings in modern French literature. Prerequisite: FR 102 or equivalent. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**311 French Conversation.** Further practice in speaking French, emphasizing current usage and promoting facility in the expression of ideas. One hour laboratory work required. Prerequisite: FR 202 or approval of instructor. Credit, 3 hours.

**312 French Composition.** Further practice in writing French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisite: FR 202 or approval of instructor. Credit, 3 hours.

**321, 322 French Literature.** Representative masterpieces and significant movements of French literature. Prerequisite: FR 202 or approval of instructor. Credit, 3 hours each semester.

**410 French Phonetics and Diction.** Theory and practical application. Required for French major. Prerequisites: FR 311, 312 or approval of instructor. Credit, 2 hours.

**411 Advanced Spoken French.** Improvement of spoken French. Prerequisites: FR 311, 312 or approval of instructor. Credit, 3 hours.

**412 Advanced Written French.** Improvement of composition skills. Prerequisites: FR 311, 312, or approval of instructor. Credit, 3 hours.

**414 French Drama Workshop.** Preparation of selected plays and dramatic readings for public presentation, emphasizing diction and interpretation. Prerequisites: FR 311, 312, or equivalent. Credit, 2 hours.

**415 French Civilization.** Political, intellectual, social, economic and artistic development of

the French nation from its origins to the present. Prerequisite: six hours of upper division French. Credit, 3 hours.

**441 French Literature of the 17th Century.** From 1600 to 1660. Prerequisite: FR 322. Credit, 3 hours.

**442 French Literature of the 17th Century.** From 1660 to 1700. Prerequisite: FR 322. Credit, 3 hours.

**445 French Literature of the 18th Century.** Contributions of the philosophes, development of the novel and drama. Prerequisite: FR 322 or approval of instructor. Credit, 3 hours.

**451 French Literature of the 19th Century.** from 1800 to 1850. Prerequisite: FR 322. Credit, 3 hours.

**452 French Literature of the 19th Century.** From 1850 to 1900. Prerequisite: FR 322. Credit, 3 hours.

**461 20th Century French Drama.** Developments in contemporary French theatre, including the surrealist theatre and the theatre of the absurd. Prerequisite: FR 322. Credit, 3 hours.

**462 20th Century Prose Literature.** Techniques and philosophy of the contemporary novel, studies in the modern essay. Prerequisite: FR 322. Credit, 3 hours.

**510 Explication de Textes.** Detailed analysis of literary texts. Credit, 2 hours.

**511 French Stylistics.** Art of writing literary French, comparative stylistics. Credit, 3 hours.

**515 Intellectual Currents in France, 16th-19th Centuries.** Selected works of fiction and non-fiction significant for the understanding of key problems and concerns in French thought and letters. Credit, 3 hours.

**516 Contemporary French Thought.** Major social, esthetic, philosophic and scientific ideas as presented by major contemporary writers of fiction and nonfiction. Credit, 3 hours.

**521 History of the French Language.** Principal phonological, morphological and semantic

developments of French from its Latin origins to the present. Prerequisite: Some familiarity with Latin recommended. Credit, 3 hours.

**523 History of the French Drama.** From its origins to Romanticism, emphasizing the classical period. Credit, 3 hours.

**524 Modern French Drama.** Representative dramatists of the 19th and 20th centuries. Credit, 3 hours.

**525, 526 History of the French Novel.** From its beginnings to the present. Credit, 3 hours each semester.

**527 History of French Poetry.** From the Middle Ages to 1900. Credit, 3 hours.

**528 History of French Poetry.** From 1900 to the present. Credit, 3 hours.

**531 Medieval French Literature.** Readings in the epic, early drama, roman courtois and other representative literary genres of the Middle Ages. Prerequisite: Some familiarity with Old French recommended. Credit, 3 hours.

**535 French Literature of the 16th Century.** Readings in French Renaissance literature with special attention to the humanist movement and to Rabelais, Montaigne and the Pleiade. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) French Literary Criticism
- (b) Corneille, Moliere and Racine
- (c) Diderot, Voltaire and Rousseau
- (d) Balzac
- (e) Romanticism
- (f) Proust
- (g) Realism and Naturalism
- (h) French Existentialist Literature
- (i) Advanced Problems in French Literature

## GERMAN

**GR 101, 102 Elementary German.** Emphasis

on pronunciation, conversation, grammar and reading. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**201, 202 Intermediate German.** Intensive review of grammar, increased emphasis on conversation; readings in contemporary prose. Prerequisite: GR 102 or equivalent. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**311, 312 German Conversation.** Expansion of idiom through oral practice dealing with contemporary articles, essays and stories. Prerequisite: GR 202 or equivalent. Credit, 2 hours each semester.

**313 German Composition.** Intensive practice in writing, emphasizing style and grammar. Prerequisite: GR 202 or equivalent. Credit, 2 hours.

**314 Introduction to German Literature.** Beginning study of German poetry, drama, the novel and the Novelle. Prerequisite: GR 313 or equivalent. Credit, 2 hours.

**321, 322 German Literature.** Masterpieces of significant movements of German literature from the beginning to the present. Prerequisite: GR 314 or approval of instructor. Credit, 3 hours each semester.

**411 Advanced German Grammar and Conversation.** Improvement of diction and idiom through intense oral review. Prerequisite: GR 312. Credit, 3 hours.

**412 Advanced German Composition.** Improvement of writing ability. Prerequisite: GR 313. Credit, 3 hours.

**445 Literary Trends of the Late 18th Century.** Literary trends of the 18th century, emphasizing Lessing, Wieland, Klopstock, Schiller, Goethe and Herder. Prerequisite: GR 322. Credit, 3 hours.

**451 Realism.** Works of representative writers of the 19th century. Prerequisite: GR 322. Credit, 3 hours.

**455 German Poetry.** Major trends in German poetry, emphasizing the writers of the 18th,

19th and 20th centuries. Prerequisite: GR 322. Credit, 3 hours.

**461 Contemporary German Literature.** Naturalism to the present. Prerequisite: GR 322. Credit, 3 hours.

**511 German Stylistics.** Art of writing literary German, comparative stylistics. Credit, 3 hours.

**521 History of the German Language.** Linguistic development of German from the earliest records to the present. Credit, 3 hours.

**523 German Drama.** Drama of the 19th and 20th centuries. Credit, 3 hours.

**525 German Novel.** Special studies in the German novel. Credit, 3 hours.

**527 The Novelle.** Special studies in the German short story. Credit, 3 hours.

**531 Middle High German Language and Literature.** Reading and discussion of specimens of Middle High German epics, romances, and other literary genres. Credit, 3 hours.

**535 Renaissance and Reformation.** Literary, historical and religious problems of the "Age of Luther." Credit, 3 hours.

**541 Baroque.** Studies in the poetry, prose and drama of the 17th and early 18th centuries. Credit, 3 hours.

**545 Goethe's "Faust."** Background and genesis of the Faust tradition with reading and interpretation of the text. Credit, 3 hours.

**551 Romanticism.** Treatment of early and late Romanticism. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) Lessing
- (b) Goethe
- (c) Schiller
- (d) Mann
- (e) Hauptmann
- (f) Kleist
- (g) Hebbel

## GREEK

**GK 101, 102 Elementary Greek.** For beginning students only. Credit, 4 hours each semester.

**201, 202 Intermediate Greek.** Plato's "Apology" and "Crito"; selections from the speeches of "Lysias" or from Homer's "Iliad" and "Odyssey." Prerequisite: GK 102. Credit, 4 hours each semester.

**301, 302 Greek Literature.** Readings in the masterpieces of classical Greek literature; advanced grammar. Authors are changed each year in accordance with needs of the class. May be repeated for credit. Prerequisite: approval of instructor. Credit, 3 hours each semester.

## ITALIAN

**IT 101, 102 Elementary Italian.** Aural/oral drill in class and laboratory, and basic grammar supplemented by simple prose readings. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**201, 202 Intermediate Italian.** Intensive review of the fundamentals of Italian grammatical structure to increase the student's ability in composition, translation and idiomatic expression. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**311, 312 Italian Composition and Conversation.** Development of writing ability and oral expression. Prerequisite: IT 202 or equivalent. Credit, 3 hours each semester.

**321, 322 Italian Literature.** Masterpieces from significant periods, movements and genres of Italian literature from the beginnings to the present. Prerequisite: IT 312 or approval of instructor. Credit, 3 hours each semester.

## JAPANESE

**JN 101, 102 Elementary Japanese.** Pronunciation, conversation and structural grammar with intensive aural/oral drill in class and

laboratory. Graduated introduction of basic readings and writing skills. Credit, 4 hours each semester.

**201, 202 Intermediate Japanese.** Grammar review and continued oral practice. Increased emphasis on reading and writing. Prerequisite: JN 102 or equivalent. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**311, 312 Japanese Conversation.** Intensive aural/oral drills towards conversational fluency. Conducted in Japanese. Prerequisite: JN 202. Credit, 2 hours each semester.

**313, 314 Advanced Japanese.** Designed to develop skill and accuracy in written Japanese. Prerequisite: JN 202 or equivalent. Credit, 3 hours each semester.

**321, 322 Japanese Literature in Translation.** Knowledge of Japanese not required. Broad view of Japanese literary development; selected representative works of the various genres and periods. Credit, 3 hours each semester.

## LATIN

**LA 101, 102 Elementary Latin.** For beginning students only. Credit, 4 hours each semester.

**201, 202 Intermediate Latin.** Selected Latin literature, both classical and post-classical; Virgil's "Aeneid"; advanced grammar. Prerequisite: LA 102 or approval of instructor. Credit, 4 hours each semester.

**321, 322 Roman Literature.** Representative masterpieces of Roman literature from the earliest extant works through the literature of the Augustan Age. Prerequisite: LA 202 or approval of instructor. Credit, 3 hours each semester.

**421, 422 Roman Literature.** Readings in the Latin masterpieces. Authors read change each year in accordance with the needs of the class. May be repeated for credit. Prerequisite: approval of instructor. Credit, 3 hours each semester.

## PORTUGUESE

**PG 101, 102 Elementary Portuguese.** Basic grammar with intensive drill in class and laboratory directed toward conversational fluency. Five lectures, 1 hour laboratory. Credit, 5 hours each semester.

**211, 212 Portuguese Composition and Conversation.** Practice in writing and speaking Portuguese, emphasizing current usage. Reports and compositions on current topics, history and culture of Brazil and Portugal. Prerequisite: PG 102 or equivalent. Credit, 3 hours each semester.

**313, 314 Advanced Portuguese Composition and Conversation.** Designed to develop skill in written Portuguese and correct oral expression. Prerequisite: approval of the instructor. Credit, 3 hours each semester.

**321, 322 Luso-Brazilian Literature.** Representative masterpieces of Portuguese and Brazilian literature from the beginning to the present. Prerequisite: PG 212 or equivalent. Credit, 3 hours each semester.

**441 19th Century Brazilian Prose.** Prose fiction and nonfiction, emphasizing the novel. Prerequisite: PG 314 or approval of instructor. Credit, 3 hours.

**449 20th Century Portuguese Poetry.** Major trends in both Brazilian and Lusitanian poetry. Prerequisite: PG 314 or approval of instructor. Credit, 3 hours.

**450 20th Century Brazilian Drama.** Development of Brazilian dramatic literature from 1900 to the present. Prerequisite: PG 314 or approval of instructor. Credit, 3 hours.

**451 20th Century Brazilian Prose.** Prose fiction and nonfiction from 1900 to the present. Prerequisite: PG 314 or approval of instructor. Credit, 3 hours.

## RUSSIAN

**RU 101, 102 Elementary Russian.** Structural grammar and basic vocabulary. Introduction and reinforcement of aural/oral reading and

writing skills. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**201, 202 Intermediate Russian.** Systematic review of grammar. Development of vocabulary through reading, writing. Drill in aural/oral skills. Prerequisite: RU 102 or equivalent. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**211, 212 Basic Russian Conversation.** Intensive aural/oral drill to supplement reading and grammatical skills acquired in RU 101, 102, 201 and 202. Required of Russian majors. Prerequisite: RU 102. Credit, 3 hours each semester.

**303, 304 Scientific Russian.** Acquisition of scientific vocabulary through reading from current Soviet scientific publications. Prerequisite: RU 102. Credit, 3 hours each semester.

**311, 312 Russian Composition and Conversation.** Development of writing ability and oral expression. Prerequisite: RU 202. Credit, 3 hours each semester.

**321, 322 Russian Literature in Translation.** The most significant works, authors and literary movements of Russian and Soviet literature. Credit, 3 hours each semester.

**411, 412 Advanced Composition and Conversation.** Designed to improve aural discrimination, self-expression in oral and written skills, emphasizing vocabulary building. Subject materials drawn from current Soviet publications. Prerequisite: RU 312. Credit, 3 hours each semester.

**417, 418 Applied Russian Phonetics.** General improvement in the student's language skills through aural/oral training in Russian phonology and an analysis of Russian orthography. Prerequisite: RU 312. Credit, 2 hours each semester.

**421 Pushkin.** Pushkin's poetry, plays and prose fiction, including "Eugene Onegin," the "Little Tragedies," "Tales of Belkin," "Queen of Spades" and the "Captain's Daughter." Prerequisite: RU 312 or approval of instructor. Credit, 3 hours.

**422 History of Russian Drama and Theatre.** Development of Russian drama and theatre from its beginning to the present. Prerequisite: RU 312 or approval of instructor. Credit, 3 hours.

**423 Dostoyevsky.** Dostoyevsky's major works of fiction, including "Crime and Punishment" and "Brothers Karamazov." Prerequisite: RU 312 or approval of instructor. Credit, 3 hours.

**424 Tolstoy.** Tolstoy's major works, including "War and Peace" and "Anna Karenina." Prerequisite: RU 312 or approval of instructor. Credit, 3 hours.

**425 Chekhov.** Chekhov's major works, representative short stories and major plays, including "Cherry Orchard" and "Three Sisters." Prerequisite: RU 312 or approval of instructor. Credit, 3 hours.

**426 Soviet Literature.** Development of Soviet literature (1917 to present) through representative authors and works, including Gorky, Sholokhov, Pasternak and Yevtushenko. Prerequisite: RU 102. Credit, 3 hours each semester.

**440 History of the Russian Language.** Linguistic evolution of the Russian language from Old Church Slavonic to present. Prerequisite: RU 312 or approval of instructor. Credit, 3 hours.

**441 Survey of Russian Culture.** The interplay of artistic, social and political forces in the development of Russian culture from the Kievan period to the present. Exclusive use of Russian language source materials. Prerequisite: RU 312 or approval of instructor. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) Pre-19th Century Russian Literature
- (b) 19th Century Russian Literature
- (c) Russian Poetry to 1890
- (d) Russian Poetry, 1890 to Present
- (e) Russian Literary Criticism

- (f) Soviet Socialism Realism
- (g) Contemporary Soviet Authors

## SPANISH

**SP 101, 102 Elementary Spanish.** Fundamentals of the language. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**103, 104 Elementary Spanish.** Fundamentals of the language for Spanish-speaking students only who have little or no formal study in the language. May be substituted for SP 101, 102 as optional courses for Spanish-speaking students only. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**201, 202 Intermediate Spanish.** Intensive review of fundamentals, composition, reading, conversation. Prerequisite: SP 102. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**203, 204 Intermediate Spanish.** May be substituted for SP 201, 202 as optional courses for Spanish-speaking students only. Emphasis on the needs of the bilingual student through composition, literature, conversation and review of grammar fundamentals. Prerequisite: SP 102 or placement. Four lectures, 1 hour laboratory. Credit, 4 hours each semester.

**311, 312 Spanish Conversation.** Designed to promote facility in coherent and expressive diction in Spanish. Prerequisite: SP 202 or equivalent. Credit, 3 hours each semester.

**313, 314 Spanish Composition.** Designed to develop skill and accuracy in written Spanish. Emphasis on structure and form. Prerequisite: SP 202 or equivalent. Credit, 3 hours each semester.

**321, 322 Spanish Literature.** Spanish literature from its beginning to the present; some emphasis on the evolution of Spanish thought and literary ideals. Prerequisite: SP 202 or approval of instructor. Credit, 3 hours each semester.

**323 Mexican-American Literature.** Represent-

tative literature in Spanish and English by Mexican Americans, emphasizing socio-cultural as well as literary values. Prerequisites: SP 202, 203 or approval of instructor. Credit, 3 hours.

**413 Advanced Spanish Grammar.** Intensive analysis of the structure of the Spanish language. Recommended for teaching majors or minors. Prerequisite: SP 313 or 314 or approval of instructor. Credit, 3 hours.

**417 Spanish Phonetics.** Pronunciation and articulation of the Spanish language. Emphasis on problems of articulation in the Spanish-speaking Southwest. Prerequisite: 3 semesters of any 300-level courses in Spanish. Credit, 3 hours.

**427, 428 Spanish-American Literature.** Significant literature and writers from the colonial period to the present. Prerequisite: SP 322. Credit, 3 hours each semester.

**429 Poetry of the Golden Age.** Prosody and the poetic schools and genres of the Golden Age. Prerequisite: SP 322. Credit, 3 hours.

**430 Drama of the Golden Age.** Dramatic works of Lope de Vega, Calderon de la Barca and their contemporaries. Prerequisite: SP 322. Credit, 3 hours.

**431 Prose of the Golden Age.** Prose fiction and nonfiction of the Golden Age (exclusive of prose drama), especially the forms of the novel. Prerequisite: SP 322. Credit, 3 hours.

**439 19th Century Poetry.** Poetic schools and prosody of the 19th century. Prerequisite: SP 322. Credit, 3 hours.

**440 19th Century Drama.** Chief dramatists and movements of the 19th century. Prerequisite: SP 322. Credit, 3 hours.

**441 19th Century Prose.** Prose fiction and nonfiction of the 19th century, emphasizing the novel. Prerequisite: SP 322. Credit, 3 hours.

**443 Life and Works of Cervantes.** Life and works of Cervantes, emphasizing "Don Quixote." Lectures, readings and a term paper. Prerequisite: 12 hours in upper division courses. Credit, 3 hours.

**449 20th Century Poetry.** Major trends in Spanish poetry from the Generation of 1898 to the Civil War. Prerequisite: SP 322. Credit, 3 hours.

**450 20th Century Drama.** Development of Spanish dramatic literature from the Generation of 1898 to the Civil War. Prerequisite: SP 322. Credit, 3 hours.

**451 20th Century Prose.** Prose fiction and nonfiction, exclusive of the drama, from the Generation of 1898 to the Civil War. Prerequisite: SP 322. Credit, 3 hours.

**460 The Latin-American Novel.** Nineteenth and 20th century novel in Latin America, emphasizing the contemporary. Prerequisite: SP 322. Credit, 3 hours.

**472 Spanish-American Civilization.** The people, growth of their institutions and culture, and aspirations of their great men. Credit, 3 hours.

**473 Spanish Civilization.** Political, intellectual, social, economic and artistic development of the Spanish nation from its origins to the present. Prerequisite: SP 322. Credit, 3 hours.

**485, 486 Spanish for Elementary Teachers.** Designed for teachers interested in introducing the teaching of Spanish in the elementary grades. Fundamentals of Spanish, integrating the techniques of teaching at the elementary level. Courses do not count toward Spanish major. Credit, 3 hours each semester.

**511 Spanish Stylistics.** Art of writing literary Spanish, comparative stylistics. Credit, 3 hours.

**520 Contemporary Spanish Poetry.** Major works of post-Civil War Spanish poetry. Credit, 3 hours.

**521 Contemporary Spanish Novel.** Major works of post-Civil War Spanish fiction. Credit, 3 hours.

**522 Contemporary Spanish Drama.** Major works of Spanish drama during the last 30 years. Credit, 3 hours.

**530 Contemporary Spanish-American Novel.**

Major works of Spanish-American fiction since World War II. Credit, 3 hours.

**531 Contemporary Spanish-American Poetry.** Major works of Spanish-American poetry since World War II. Credit, 3 hours.

**540 History of the Spanish Language.** Linguistic development of the Spanish language from the epoch of Vulgar Latin to the present day. Credit, 3 hours.

**545 Concepts of Literary Criticism.** Aims and methods of modern literary scholarship. Discussion of major theories of literary analysis. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) Medieval Spanish Literature
- (b) Renaissance Spanish Literature
- (c) Baroque Spanish Literature
- (d) 18th Century Spanish Literature
- (e) 19th Century Spanish Literature
- (f) 20th Century Spanish Literature
- (g) Colonial Spanish-American Literature
- (h) 19th Century Spanish-American Literature
- (i) 20th Century Spanish-American Literature
- (j) National Spanish-American Literature
- (k) Language Studies

**Special Graduate Courses:** 500, 590, 591, 592, 593, 600, 690, 691, 692, 700, 790, 791, 799. (See page 46.) Prerequisites for SP 590, 690, 790: approval of instructor, advisor and department chairman. Secure forms in the Foreign Languages Office.

## Geography

**Professors:**

LOUNSBURY (ASB 209A), BAKER,  
DURRENBERGER, EKBLAW, HARING,  
HOLMES

**Associate Professors:**

ACKER, McTAGGART, WAGSTAFF

**Assistant Professors:**

ALDRICH, COMEAUX, FROST, HENKEL,  
MAXWELL

### Departmental Major Requirements

#### Bachelor of Arts Degree Curriculum

GEOGRAPHY — Consists of 45 semester hours of credit, of which 30 must be in geography, and the remainder of the 45 hours in approved related fields selected in consultation with the advisor.

The following courses must be included in the major:

	<i>Semester Hours</i>
GP 491; or GP 371 and GC 375 . . .	6
GC 141 or GC 441; and GC 251 or GC 253 . . . . .	6
GP 211 or GP 411; and GP 212 or GP 312 . . . . .	6
	18

The remaining 12 hours in geography and 15 hours in related disciplines to be selected in consultation with the advisor in view of the individual student's field of interest. GP 111 and GC 121 will not count towards the major. At least 18 semester hours must be in upper division courses.

#### Bachelor of Science Degree Curriculum

GEOGRAPHY — Consists of 45 semester hours of credit, of which 30 must be in geography, and the remainder in approved related fields.

The following courses must be included in the major:

	<i>Semester Hours</i>
GP 491; or GP 371 and GC 375 . . .	6
GC 141 or GC 441; and GC 251 or GC 253 . . . . .	6
GP 211 or GP 411; and GP 212 or GP 312 . . . . .	6
	18

An additional 12 hours of GP geography courses and 15 hours in related fields to be selected in consultation with the advisor in view of the individual student's field of interest. GP 111 and GC 121 will not count towards the major. At least 18 hours must be in upper division courses.

### Departmental Major Teaching Field Requirements

#### Bachelor of Arts in Education Degree Curriculum

GEOGRAPHY — Consists of 45 semester hours of credit, of which a minimum of 24 must be in geography and 18 in a related teaching field or fields. The following courses are required: GP 111 or 411, GC 121 and 480.

Departmental minor teaching field requirements (Elementary and Secondary Education) consists of a minimum of 18 semester hours of credit. Courses GP 111 or 411 and GC 121 and 480 are required. The remaining hours are to be selected in consultation with an advisor.

### Departmental Graduate Programs

The Department of Geography offers programs leading to the degree of Master of Arts. Consult the *Graduate Catalog* for requirements.

#### CULTURAL GEOGRAPHY

**GC 121 World Geography.** Description and analysis of areal variations in social, economic and political phenomena in major world regions. Credit, 4 hours.

**141 Introduction to Economic Geography.** Production, distribution and consumption of various types of commodities of the world and relationships to the activities of man. Credit, 3 hours.

**251 Introduction to Political Geography.** Relationship between the social-physical environment and the state. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**253 Introduction to Cultural and Historical Geography.** Cultural patterns, including such phenomena as language, religion and various aspects of material culture. Origins and diffusion and division of the world into culture areas. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**322 Geography of Anglo-America.** Spatial distribution of relevant physical, economic and cultural phenomena existing in the United States and Canada. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**323 Geography of Latin America.** Spatial distribution of relevant physical, economic and cultural phenomena existing in South, Middle and Caribbean America. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**325 Geography of Europe.** Spatial distribution of relevant physical, economic and cultural phenomena existing in Europe. Recommended for social studies teachers and students of European history. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**326 Geography of Asia.** Spatial distribution of relevant physical, economic and cultural phenomena existing in Asia, excluding the U.S.S.R. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**327 Geography of Africa.** Spatial distribution of relevant physical, economic and cultural phenomena existing in Africa. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**332 Geography of Australia and Oceania.** Spatial distribution of relevant physical, economic and cultural phenomena existing in Australia, New Zealand and Pacific Islands. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**361 Urban Geography.** External spatial relations of cities, internal city structure and spatial aspects of urban problems in various parts of the world, particularly in the United States. Credit, 3 hours.

**362 Agricultural Geography.** Economic, physical and social factors of agriculture which affect the variation in space and time of agricultural land use. Prerequisite: GC 141. Credit 3 hours.

**363 Manufacturing Geography.** Economic, physical and social factors of manufacturing which affect the variation in space and time of such activities. Plant location techniques, industrial location theory and case studies will be included. Prerequisite: GC 141. Credit, 3 hours.

**364 Geography of Energy.** Production, transportation and consumption of energy, emphasizing the electric power industry and its environmental problems. Credit, 3 hours.

**375 Introduction to Geographic Research Methods.** Scientific techniques used in geographic research. Prerequisite: approval of instructor. Credit, 3 hours.

**390 Geographic Literature.** Current publications in geography; authors, trends of research and sources. Prerequisite: approval of instructor. Credit, 2 hours.

**395 Quantitative Methods in Geography.** Use of selected mathematical and statistical techniques in geographic problem solving. Prerequisites: General statistics course or approval of instructor. Credit, 3 hours.

**401 Topics in Cultural, Economic and Political Geography.** Open to students qualified to pursue independent studies. Prerequisite: approval of instructor. Credit, 1-3 hours.

**421 Geography of Arizona and Southwestern United States.** Spatial distribution of physical, economic and cultural phenomena existing in Arizona and the southwest. Credit, 3 hours.

**423 Geography of South America.** Spatial distribution of relevant physical, economic and cultural phenomena existing in South America. Prerequisites: GC 323 or approval of instructor. Credit, 3 hours.

**424 Geography of Middle America.** Spatial distribution of relevant physical, economic and cultural phenomena existing in Central America. Prerequisites: GC 323 or approval of instructor. Credit, 3 hours.

**425 Geography of Canada.** Spatial distribution of relevant physical, economic and cultural phenomena existing in Canadian mainland and islands. Prerequisites: GC 322 or approval of instructor. Credit, 3 hours.

**426 Geography of the Soviet Union.** Spatial distribution of relevant physical, economic and cultural phenomena existing in the Soviet Union. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**428 Geography of Middle East.** Spatial distribution of relevant physical, economic and cultural phenomena existing in the Near East, emphasizing current political and economic developments. Prerequisites: GC 121 or approval of instructor. Credit, 3 hours.

**429 Geography of Southeast Asia.** Spatial distribution of relevant physical, economic and cultural phenomena existing in Southeastern Asia between India and China. Prerequisites: GC 326 or approval of instructor. Credit, 3 hours.

**430 Geography of South Asia.** Spatial distribution of relevant physical, economic and cultural phenomena existing in India, Pakistan and Afghanistan. Prerequisites: GC 326 or approval of instructor. Credit, 3 hours.

**431 Geography of the Far East.** Spatial distribution of relevant physical, economic and cultural phenomena existing in Japan, China, Korea, excluding the U.S.S.R. Prerequisites: GC 326 or approval of instructor. Credit, 3 hours.

**441 Economic Geography.** Spatial distribution of primary, secondary and tertiary economic and production activities. Not open to students who have taken GC 141. Credit, 3 hours.

**442 Geography of Transportation.** Geographic analysis of world trade routes and transportation systems. Prerequisites: GC 141 or 441. Credit, 3 hours.

**443 Marketing Geography.** Measurement and analysis of markets, channels of distribution through which goods move from producer to consumer, and selection of retail sites. Prerequisites: GC 141 or 441. Credit, 3 hours.

**444 Applied Urban Geography.** Designed to prepare the student for employment in planning agencies. Includes the application of urban geographic principles to present day planning problems. Prerequisite: GC 361. Credit, 3 hours.

**452 Military Geography.** Geographic principles in the analysis of military power, planning, supply and strategy. Credit, 2 hours.

**455 Historical Geography of Anglo-America.** Changing geography of the United States and Canada from pre-Columbian times to about 1900. Emphasis on evolving economic patterns. Recommended for social studies teachers and students of American history. Credit, 3 hours.

**480 Methods of Teaching Geography.** Organization and presentation of appropriate content in geography. Prerequisites: SE 311 or concurrently and 18 hours of geography or approval of instructor. Credit, 3 hours.

**496 History of Geographic Thought.** Development of geographic thought from Strabo and Herodotus to Humboldt and Ritter. Credit, 2 hours.

**500 Advanced Research Methods in Geography.** Specialized research techniques and methodologies in economic, political or cultural geography. Credit, 1-3 hours.

**524 Geographic Area Analysis.** Economic, physical and social factors affecting land use in a given area or region. Prerequisites: 15 hours of geography and approval of instructor. Credit, 3 hours.

**529 Contemporary Geographic Thought.** Comparative evaluation of current philosophy concerning the nature and trends of geography. Prerequisites: 15 hours of geography and approval of instructor. Credit, 3 hours.

**591 Seminar.** Selected topics in economic, political or cultural geography. Credit, 3 hours.

### PHYSICAL GEOGRAPHY

**GP 111 Introduction to Physical Geography.** Spatial and functional relationships among climates, landforms, soils, water and plants. Three lectures, 2 hours laboratory. Credit, 4 hours.

**210 Physical Environment.** Basic concepts and principles in physical geography relating to environmental problems pertinent to contemporary society. Pollution, maladjusted land use, resource exploitation, etc. will be covered. Credit, 3 hours

**211 Introduction to Landforms.** Geographic characteristics of the major types of landforms, stressing areal association by the use of maps. Prerequisite: GP 111. Two lectures, 3 hours laboratory. Credit, 3 hours.

**212 Introduction to Meteorology.** Controls of weather elements — temperature, moisture, air pressure and winds. Energy exchange, heat and water budgets. Prerequisite: GP 111. Credit, 3 hours.

**271 Maps and Map Reading.** Techniques of

interpretation of the many types of maps, map projections and history of mapping. Prerequisite: GP 111. Credit, 3 hours.

**312 Climatology.** Principles of climate; attention to climatic regions and climate cycles. Prerequisite: GP 212. Credit, 3 hours.

**313 Marine Geography.** Submarine topography, water masses, circulation, isohalines, isotherms, biotic environment, marine sedimentation as factors in the geography of the oceans. Prerequisites: GP 111; CH 111 or PH 101 or equivalent. Credit, 3 hours.

**371 Cartography.** Basic map drafting, grid compilation, simple design and use of cartographic instruments. Prerequisites: GP 111, 271. Four hours laboratory. Credit, 3 hours.

**372 Air Photo Interpretation.** Aerial photographs as a means of determining topography, vegetation and culture; scale, use of index, vertical and oblique photographs and stereoscopes. Prerequisites: GP 111, 211. Credit, 3 hours.

**381 Geography of Natural Resources.** Nature and distribution of natural resources and the problems and principles associated with their use. Credit, 3 hours.

**401 Topics in Physical Geography.** Open to students qualified to pursue independent studies. Prerequisite: approval of instructor. Credit, 1-3 hours.

**411 Physical Geography.** Basic introduction to physiography and the physical elements of the environment. Open only to students who have not taken GP 111. Credit, 3 hours.

**433 Physical Geography of the Polar Lands.** Regional study of advantages and limitations of the natural environment upon present and future problems involving resource distribution, human activities, and regional and inter-regional adjustments. Prerequisites: GP 111 or approval of instructor. Credit, 3 hours.

**471 Cartographic Design.** Map compilation, design, scribing, color selection and reproduction. Prerequisite: GP 371. Four hours laboratory. Credit, 3 hours.

**481 Environmental Geography.** Spatial analysis of environmental quality including land use, atmospheric and resource use problems. Prerequisites: GP 111 and GC 141 or approval of instructor. Credit, 3 hours.

**491 Geographic Field Methods.** Field techniques including use of aerial photos, large-scale maps, fractional code system of mapping; urban and rural field analysis. Prerequisite: approval of instructor. Summer sessions only. Credit, 6 hours.

**500 Advanced Research Methods in Physical Geography.** Specialized research techniques and methodologies. Credit, 1-3 hours.

**591 Seminar.** Selected topics in physical geography. Credit, 3 hours.

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## Geology

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### Professors:

PÉWE (AG 142), FISHER, MILLER,  
MOORE, RAGAN

### Associate Professors:

BUSECK, LUNDIN

### Assistant Professors:

LARIMER, SHERIDAN

## Departmental Major Requirements Bachelor of Arts Degree Curriculum

**GEOLOGY** — Consists of 45 semester hours. Courses GL 100 or 101 or 301, 102, 310, 323, 324 and 335 or their equivalents are required. Supporting required courses in related fields: CH 113, 115, 116; PH 111, 112; MA 118, 226. The additional work necessary to complete the major must be taken from the departmental list of approved courses. GL 472, 475, 476 and 480 cannot be used to fulfill the requirements for a major.

### Bachelor of Science Degree Curriculum

**GEOLOGY** – 45 semester hours are required, including the following basic courses or their equivalent: GL 100 or 101 or 301, 102, 310, 321, 323, 324, 335, 435 and an approved summer geology field course for at least six credits. Supporting courses required in related fields are CH 113, 115, 116; PH 115, 116 (PH 111, 112 are acceptable alternatives); MA 120, 121. To complete the total required hours, other courses in geology or in related fields listed by the department as approved may be taken. GL 472, 475, 476 and 480 cannot be used to fulfill the requirements for a major. One semester of approved biological science is also required (BO 100 or ZO 100, or approved equivalent). One year of foreign language is required; French, German or Russian is strongly recommended.

### Bachelor of Arts in Education Degree Curriculum (Departmental Teaching Major)

**GEOLOGY** – Consists of 36-42 semester hours of credit. The following courses in geology or their equivalents are required: GL 100 or 101, 102, 310, 321, 323, 335, 362 and 480. Additional courses and substitutions that are necessary to complete the major will be selected from geology and closely related fields and approved by the student's advisor. Supporting courses required in related fields are CH 113, 114; PH 111; MA 118.

### Departmental Teaching Minor

Twenty-four semester hours will be selected from courses below. The following courses or their equivalent are recommended for a teaching minor in Geology (Earth Science):

GL 100 or 101, 102, 480. Any of the following courses or their equivalent may be used to complete a minor in Geology (Earth Science): GL 310, 321, 323, 324, 335, 362, 400, 435 and 436. Any substitutions for the above courses must be approved by the advisor.

### Departmental Graduate Programs

The Department of Geology offers programs leading to the degree Master of Science. Consult the *Graduate Catalog* for requirements.

**GL 100 General Geology.** Nonlaboratory introduction to physical and historical geology. The earth, its origin, processes that affect it, sequence of events in its evolution and succession of life upon it; appreciation of the development of the physical landscape. GL 100 and 101 may not both be taken for credit. Four lectures, field trips. Credit, 4 hours.

**101 Physical Geology.** Basic principles of geology. Geology, geochemistry, and geophysics in relation to materials and processes acting upon and within the earth's crust. Rocks, minerals, weathering, earthquakes, mountain building processes, volcanoes, running water, ground water and glaciers. Geological aspects of the environment in which the student will spend his life. Three lectures, 3 hours laboratory, field trips. Credit, 4 hours.

**102 Historical Geology.** History of the earth from its earliest stages to the present; sequence of geological events and processes; succession of life forms; dating methods and meaning of time. Laboratory work includes reconstruction of geologic history with geologic maps and structure sections. Plant and animal life throughout geologic time. Prerequisite: GL 100 or 101 or 201. Three lectures, 3 hours laboratory, field trips. Credit, 4 hours.

**201 Geology of the Earth, Moon and Planets.** Modern geologic studies of the planets, satellites and meteorites. Origin and evolution of the earth. Rocks, minerals, mountain building, continental drift, glaciers. Geologic

processes operating on earth as compared to the moon and planets. Field trips. Credit, 3 hours.

**301 Geology for Engineers.** Physical geology emphasizing structural geology, ground water, soil genesis and relation of geology to engineering problems. Laboratory exercises include rock and mineral identification and interpretation of aerial photographs and geologic and topographic maps. Prerequisite: CH 114. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**310 Structural Geology.** Introduction to the mathematical description of finite strain and stress. Application of mechanical principles to the processes and results of rock deformation. Geometrical techniques used in describing structures and solving problems. Prerequisite: GL 101 or 301. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**321 Mineralogy.** Crystallography, crystal chemistry and crystal physics as applied to minerals; origin and occurrence of minerals; introduction to X-ray technique. Prerequisites: MA 118, CH 115, 116, or concurrent enrollment. Geology majors must enroll in GL 323 concurrently. Credit, 3 hours.

**323 Mineralogy Laboratory.** Techniques in determinative mineralogy and crystallography; hand specimen study. Corequisite: GL 321. Six hours laboratory, field trips. Credit, 2 hours.

**324 Petrology-Petrography.** Theoretical and laboratory study of the origin and classification of igneous and metamorphic rocks. Optical mineralogy. Hand specimen and thin section study of rocks. Prerequisites: GL 321, 323; CH 113. Three lectures, 6 hours laboratory, field trips. Credit, 5 hours.

**335 Invertebrate Paleontology.** Structure and evolutionary development of fossil invertebrates, emphasizing morphology of skeletal parts and the application of paleontology to stratigraphic problems. Prerequisites: GL 102; ZO 100 or 250 or BO 100. Two lectures, 6 hours laboratory, field trips. Credit, 4 hours.

**362 Geomorphology.** Land forms and processes which create and modify them. Laboratory and field study of physiographic features. Prerequisites: GL 101, 310, 324 or concurrent enrollment. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**400 Geology Colloquium.** Presentation of recent research by geology juniors, seniors, graduate students, faculty members and invited guests. Required each semester of all junior, senior and graduate geology majors. May be repeated for credit. Credit, 1 hour.

**410 Rock Mechanics.** Theoretical and applied aspects of the mechanical behavior of rock. Physical properties of rock masses and their origin, field methods, and testing techniques. Theoretical and model studies. Prerequisite: upper division standing in geology or engineering or approval of instructor. Field trips. Credit, 3 hours.

**412 Geotectonics.** Origin of continents and ocean basins. Evolution of the crust in time. Drifting, sea floor spreading and other large scale movements of the earth's crust. Upper mantle processes. Emphasis on current work. Prerequisite: GL 310. Credit, 3 hours.

**418 Geophysics.** Solid earth geophysics; geomagnetism, gravity, seismology, heat flow, emphasizing crust and upper mantle. Prerequisites: GL 101 or 301, PH 112, or approval of instructor. Credit, 3 hours.

**420 Volcanology.** Distribution of past and present volcanism, types of volcanic activity, mechanism of eruption, form and structure of volcanoes, geochemistry of volcanic activity. Prerequisites: GL 101 or 301, CH 113. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**424 Chemical Petrology.** Applications of thermodynamic principles to the study of igneous and metamorphic rocks. Modern laboratory techniques utilized in solving petrologic problems. Prerequisites: either GL 324 and 482, or CH 341, or approval of instructor. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**426 Physical Petrology.** Total petrologic environment of selected rock suites. Effects of thermal and deformational processes on the origin of rocks. Prerequisites: GL 310 and 324. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**428 Sedimentary Petrography.** Microscopic, geochemical and X-ray analysis of sedimentary components and textures of consolidated and unconsolidated sediments. Prerequisites: GL 321, 323 and 450. Two lectures, 3 hours laboratory. Credit, 3 hours.

**432 Micropaleontology I.** Taxonomy, morphology and ecology of ostracodes and conodonts. Prerequisite: GL 335. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**433 Micropaleontology II.** Taxonomy, morphology and ecology of foraminifera and other unicellular organisms. Prerequisite: GL 335. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**435 Sedimentology.** Origin, transport, deposition and diagenesis of sediments and sedimentary rocks. Physical and chemical analysis and interpretation of processes affecting sedimentary environments and their products. Prerequisites: GL 102, 321 and 323. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**436 Principles of Stratigraphy.** Sources of sediments, depositional environments and the principles in delimiting, correlating and naming of stratigraphic units. Prerequisites: GL 102, 335, 435. Three lectures, 1 hour laboratory, field trips. Credit, 3 hours.

**441 Ore Deposits.** Origin, occurrence, structure and mineralogy of ore deposits. Prerequisites: GL 321, 323 and 324. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**446 Ground Water Geology.** Principles governing the occurrence, movement, quality, classification and recovery of underground water, with special reference to Arizona. Prerequisite: GL 435. Field trips. Credit, 3 hours.

**462 Periglacial Geology.** Geological and engi-

neering importance of seasonal and perennially frozen ground (permafrost). Properties, distribution, origin of ice in the ground and its application to engineering and land utilization problems. Fossil frost features and their use as paleoclimatic indicators. Prerequisites: GL 101, 435; PH 111. Field trips. Credit, 3 hours.

**472 Earth Science.** Principles of earth science and their influence in forming the scenic features on the surface of the earth. GL 472 cannot be taken for credit by one who has completed GL 100 or 101 or their equivalents. Field trips. Credit, 3 hours.

**475, 476 Earth Science for In-Service Teachers.** An integrated approach to the concepts and principles of earth science. Prerequisite: approval of instructor. Field trips. Credit, 3 hours each semester.

**480 Methods of Teaching Earth Science.** Organization and presentation of appropriate content in earth science; the E.S.C.P. laboratory approach; preparation of laboratory and demonstration materials. Prerequisite: approval of instructor. Field trips. Credit, 3 hours.

**481 Geochemistry.** Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere. Prerequisites: CH 341 or 441 or GL 321. Credit, 3 hours. (Same as CH 481)

**482 Physical Geochemistry.** Applications of thermodynamic and kinetic principles to geochemical processes. Prerequisites: GL 481 or its prerequisites. Credit, 3 hours. (Same as CH 482)

**485 Meteorites and Cosmochemistry.** Chemistry of meteorites and their relationship to the origin of the earth, solar system and universe. Prerequisite: GL 481 or 482. Credit, 3 hours. (Same as CH 485)

**490 Topics in Geology.** Special topics in mineralogy, petrology, economic geology, geochemistry, petroleum geology, regional

geology, geomorphology, paleontology, stratigraphy, sedimentology, field geology and structural geology. Open to qualified students. Prerequisite: approval of instructor. Credit, 1-3 hours.

**510 Advanced Structural Geology.** Progressive finite strain in three dimensions as applied to problems of rock flowage. Mechanical processes of folding. Theoretical basis of granite tectonics. Processes of crystal deformation and the problem of preferred crystallographic orientation. Prerequisites: GL 310, 324. Field trips. Credit, 3 hours.

**534 Advanced Paleontology.** Stratigraphic distribution and evolutionary trends of fossil invertebrates; special reference to principles of taxonomy. Prerequisite: GL 335. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**541 Metalliferous Ore Deposits.** Field and laboratory study of selected mining districts. Samples of ores and associated rocks collected in the field will be studied in the laboratory to determine type and genesis of mineralization. Prerequisite: approval of instructor. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**561 Glacial Geology.** Properties, distribution and origin of glacial deposits, including principles of their stratigraphy and correlation. Processes of glacial erosion and deposition. Prerequisite: GL 362. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**562 Pleistocene Geology.** Geology of the Pleistocene epoch in both glaciated and unglaciated areas. Stratigraphy and correlation of Pleistocene deposits. Special reference to the Southwest. Prerequisite: GL 362. Two lectures, 3 hours laboratory, field trips. Credit, 3 hours.

**580 Laboratory Techniques in Geochemistry.** Tools and techniques used in geochemical research. Experiments of geochemical interest are done using the emission spectrograph, spectrophotometer, X-ray spectrometer, mass spectrometer and radioactivity counters. Sample selection and preparation and wet

chemistry. Prerequisite: approval of instructor. One lecture, 6 hours laboratory. Credit, 3 hours.

**581 Isotope Geochemistry.** Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Prerequisite: approval of instructor. Credit, 3 hours. (Same as CH 581)

**582 Topics in Geochemistry and Cosmochemistry.** Topics of current interest for students in geology, chemistry and other fields. A broad sampling of data and thought concerning phase equilibria, element distribution, meteorites, the earth and other planets. Prerequisite: approval of instructor. May be repeated for credit. Credit, 3 hours. (Same as CH 582)

**583 Phase Equilibria and Geochemical Systems.** Natural reactions at high temperatures and pressures; silicate, sulfide and oxide equilibria. Prerequisite: GL 482. Credit, 3 hours. (Same as CH 583)

**585 Optical Crystallography.** Geometric relation of the optical indicatrix to the morphologic crystal directions as exemplified by the study of feldspars with the universal stage on the polarizing microscope. Two laboratories. Credit, 2 hours.

**586 X-ray Crystallography.** Determination of unit cell by means of single crystal using Precession of Weissenberg methods or from powder data. Credit, 2 hours.

**591 Seminar.** Credit, 2-3 hours. Topics may be selected from the following:

- (a) Igneous, Metamorphic, and Sedimentary Petrology
- (b) Pleistocene Environment
- (c) Seismology and Applied Geophysics
- (d) Structural Geology
- (e) Paleocology
- (f) Advanced Stratigraphy
- (g) Mineralogy and Crystallography
- (h) Mineral Deposits
- (i) Geochemistry

(j) Physical and Chemical Sedimentology

(k) Biostratigraphy

See related courses: AN 541 Archaeological Pollen Analysis; BO 490 Paleobotany.

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## Health, Physical Education and Recreation

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### Professors:

RICHARDSON (MPE M136), DEACH, SMITH, STEWART, THOMSON, TOOHEY, WEGNER

### Associate Professors:

BRYANT, DEZELSKY, GISOLO, GREEY, KAJIKAWA, KLANN, ODENKIRK, PACKER, PITTMAN, STEVERSON, STONE

### Assistant Professors:

BACHMANN, GRIER, JOHNSON, KUSH, LITTLEWOOD, PIKE, PLUMMER, ROBERTS, WINKLES, WULK

### Instructors:

BAKER, BREDEHOFT, CASTILLO, HAROLDSON, KENTERA, LESSARD, MANN, McDONALD, OWENS, RANGELER, ROBINSON, ROBISON, TANARA, THOMPSON

## Departmental Major Requirements

### Bachelor of Science Degree Curriculum

BOYS' CLUB ADMINISTRATION – Consists of 45 semester hours of credit of which at least 18 must be in upper division courses. Required are PX 100; SE 100; RE 150, 262, 362, 372, 472; PE 430, 472. The remaining courses will be selected in consultation with an advisor and determined by the needs and interests of the student.

**HEALTH EDUCATION** – Consists of 42 semester hours of credit. Courses HE 100, 260, 261, 360, 480, 481; MI 201; ZO 201, 202; CH 101 are required.

An additional 8 hours are to be selected from related fields by the student in consultation with the advisor. At least 18 semester hours must be in upper division courses.

**PHYSICAL EDUCATION** – Consists of 37 semester hours of credit of which 30 must be in the major field. Courses BI 100, or ZO 100, or CH 101, and PE 161, 250, 251, 252, 253, 385, 386 and 472 are required. At least 18 semester hours must be in upper division courses and the entire program must be planned in consultation with the student's advisor.

**RECREATION** – Consists of 45 semester hours of credit of which 28 must be in recreation and 17 in closely related fields to be approved by the advisor in consultation with the student. Courses RE 120, 150, 260, 262, 362, 372, 463, 472 and two semester hours of physical education activity courses are required. At least 20 semester hours must be in upper division courses.

### **Special Programs**

#### **Pre-Occupational and Pre-Physical Therapy**

Students desiring to prepare for training and certification in occupational or physical therapy may major in an appropriate degree program in the College of Liberal Arts or in the College of Education, and upon graduation enroll in a certification program offered by an approved school of occupational or physical therapy. The internship and certification programs of these schools usually vary from 10 to 15 months.

Many students transfer to appropriate professional therapy schools upon completion of their sophomore year and begin

technical training curriculums with the junior year.

Students who remain to graduate should major in programs of the following types: health education, physical education, psychology, sociology, recreation or life-science oriented disciplines and gear their courses to meet the specific requirements for certification programs of the fifth year certification schools of their choice.

Advisors will assist students with the identification of courses essential for admittance to the professional schools of their choice.

### **Departmental Major Teaching Field Requirements**

#### **Bachelor of Arts in Education Degree Curriculum**

**DANCE** – Consists of 45 semester hours of credit of which the following are required: DN 130, 131, 160, 230, 232, 261, 263 and 490; PE 385, 480; ZO 201, 202. First semester students should take: DN 130 Dance (modern and/or ballet), DN 160, 261; EN 101 and SO 101; MU 107, or other general studies. At least 18 hours must be in upper division courses.

**HEALTH EDUCATION** – Consists of 42 semester hours of credit. Courses HE 100, 260, 261, 360, 480, 481; MI 201, ZO 201, 202; CH 101 are required.

An additional 8 hours are to be selected from related fields by the student in consultation with the advisor. At least 18 semester hours must be in upper division courses.

**PHYSICAL EDUCATION** – Consists of 37 semester hours of credit of which the following are required: BI 100 or ZO 100 or CH 101, and PE 161, 250, 251, 252, 253, 366, 385, 386, 400 and 472. Women majors are required to take PE 368, and men majors are required to take PE 364, 365 and 462. At least 18 semester hours must be in upper

division courses and the entire program must be planned with the students' advisor.

### **Departmental Minor Teaching Field Requirements (Secondary Education)**

**DANCE** – Consists of 24 semester hours of credit. Courses PE 250, 253, DN 261, 360 and 361 are required. The remaining hours are to be selected in consultation with an advisor.

**HEALTH EDUCATION** – Consists of 24 semester hours of credit. Courses HE 100, 260, 261, 360, 480, 481 are required. The remaining hours are to be selected in consultation with a health education advisor.

**PHYSICAL EDUCATION-COACHING (MEN)** – Consists of 24 semester hours of credit. Courses ZO 201, 202; PE 385, 386, 462 and 472 are required; plus four hours from PE 364, 365, selected in consultation with an advisor.

**PHYSICAL EDUCATION (WOMEN)** – Consists of 24 semester hours of credit. Courses 368 and 480 are required; plus 12 semester hours from PE 110, 111, 210, 211, 250, 251, 252, 253, 366. The remaining hours are to be selected in consultation with an advisor.

### **Departmental Major Requirements**

#### **Bachelor of Fine Arts Degree Curriculum**

**DANCE** – Consists of 70 semester hours of credit in dance and related fields. Courses DN 130, 131, 160, 230, 232, 261, 262, 263, 330, 331, 332, 380, 464, 490; PE 385; ZO 201, 202; DR 110; MP 133 are required. First semester students should take: DN 130 Dance (modern and/or ballet), DN 160, 261; EN 101; MU 100 and SO 101 or AN 102 or other humanities. At least 30 semester hours must be in upper division dance courses.

### Departmental Graduate Programs

The Department of Health, Physical Education and Recreation offers programs leading to the degrees Master of Science in Physical Education, Master of Arts in Education (Health and Physical Education), Education Specialist (Health and Physical Education), Doctor of Education (Health and Physical Education). Consult the *Graduate Catalog* for requirements.

#### DANCE

**DN 130 Dance.** Folk, modern, social, square, tap and other dance activities. Three times a week. May be repeated for credit. Credit, 1 hour.

**131 Music for Dance.** Elements of music, music structures and their relationship to dance. Emphasis on rhythmic analysis and dance accompaniment. Credit, 2 hours.

**160 Contemporary Dance.** Orientation to the field of dance with particular reference to trends. Credit, 2 hours.

**230 Dance.** Intermediate levels. Continuation of DN 130. Three times a week. May be repeated for credit. Credit, 1 hour.

**232 Dance Notation I.** Contemporary systems of dance notation. Experiences in recording and the interpretation of dance scores. Credit, 2 hours.

**261 Fundamentals of Choreography.** Analysis of theme and dramatic ideas drawn from poetry, drama, music and other art forms for use in dance choreography. Prerequisite: approval of instructor. One lecture, 2 hours laboratory. Credit, 2 hours.

**262 Dance Production I.** Theory of lighting and costuming as related to dance. Credit, 2 hours.

**263 Dance Production II.** Theory and practice of programming, make-up, scenery and sound as related to dance production. One lecture, 2 hours laboratory. Prerequisite: DN 262 or approval of instructor. Credit, 2 hours.

**280 History and Philosophy of Dance.** Dance from ancient times to the present. Consideration of dance as an art in relation to other arts; primitive, pre-classic, and modern forms. Credit, 2 hours.

**330 Dance.** Advanced levels. Continuation of DN 230. Three times a week. May be repeated for credit. Credit, 1 hour.

**331 Advanced Modern Dance.** Dance technique and elements of performance. Three hours a week. May be repeated for credit. By permission of instructor only. Credit, 1 hour.

**332 Dance Notation II.** Advanced study of the systems of dance notation. Prerequisite: DN 232. Credit, 3 hours.

**360, 361 Theory and Practice of Teaching Dance.** Creative, folk, square, social, modern and other dance forms. Analysis and acquisition of materials suitable for school and recreational use. Separate sections offered for the various emphases. One lecture, 2 hours laboratory. Credit, 2 hours.

**367 Children's Dance.** Theory and practice of teaching creative, folk, square and other dance forms for children. Designed for dance majors and related curriculum. Credit, 3 hours.

**380 Dance in Diverse Cultures.** Influence of dance in selected cultures. Required for dance majors. Credit, 3 hours.

**463 Advanced Choreography.** Investigation and practice of archaic, pre-classic, and contemporary styles of choreography. Prerequisite: DN 261 or approval of instructor. Credit, 3 hours.

**464 Choreography and Accompaniment.** Function of accompaniment for dance; experience in the use of percussion, voice, records, piano and selected instruments in relation to their use in choreography. Credit, 2 hours.

**490 Senior Performance in Dance.** Original choreography for solo or group performance with analysis and critique of problems encountered in production. May be repeated once for credit. Prerequisites: DN 261 and 463 or 464. Credit, 2 hours.

#### HEALTH EDUCATION

**HE 100 Personal Health.** Modern man and his struggle for achieving harmony between the individual's slowly-changing inner environment and the rapidly-changing outer environment of the culture. Credit, 3 hours.

**260, 261 Foundations of Health Service.** First semester, concepts in the etiology of chronic and degenerative disease, the epidemiology of communicable diseases, and emotional health and drug addiction applied to school and community health education; second semester, concepts in family life education, consumer health education and nutrition applied to school and community health. Health Education majors and minors only. Credit, 3 hours each semester.

**360 School Health.** Basic plan of the school health program; health services, health instruction and school health environment. Analysis of school health problems. Credit, 3 hours.

**480 Methods of Teaching Health.** Techniques and materials for health instruction. Health Education majors and minors only. Credit, 3 hours.

**481 Public and Community Health.** Major areas of public and community health and principles involved in providing adequate community health programs, particularly in Arizona. Afternoon and evening field trips may be scheduled. Credit, 3 hours.

**501 Contemporary World Health Problems.** Recent discoveries in medicine, engineering and life sciences, and their application to personal and community health. Malnutrition, venereal diseases, tuberculosis, malaria, leprosy, parasitical infestations, radiation, environmental pollution and other current problems as they affect the United States. Credit, 3 hours.

**502 Health Problems of the Southwest.** Coccidioidomycosis, allergies, vector infestations, diabetes among the Pima Indians, arthritis, dysenteries, rabies, airborne viruses,

histoplasmosis, sanitation, air and water pollution, pesticide contamination of food products and other current problems. Credit, 3 hours.

**503 Field Experience in Community Health.** Supervised student participation in community health service programs such as State and County Health Department, Indian Health Service, U. S. Public Health Service and private health agencies. May be repeated for credit up to 6 semester hours. Credit, 1-6 hours.

**550 History and Philosophy of Health Education.** History of health education from early civilizations to present. Major emphasis traces historical development of, and philosophical bases for, health education in the United States. Credit, 3 hours.

**554 Sociological Aspects of Health Education.** Medicare, Medicaid, World Health Organization, Peace Corps, the U. S. Public Health Service. The inner city and health, and community health services. Credit, 3 hours.

**560 Curriculum Construction in Health Education.** Problems of curriculum construction with respect to acquisition of materials, establishment of basic curriculum philosophies, application of education principles, and sequence of course content. Credit, 3 hours.

**562 Evaluation in Health Education.** Techniques and devices for evaluating school health programs. Credit, 3 hours.

**563 Administration of School Health Programs.** Principles and techniques for coordinating and administering school health programs; personnel, legal aspects, public relations, policies, health services and instruction. Meets teacher certification requirement. Prerequisite: HE 360 or teaching experience. Credit, 3 hours.

## PHYSICAL EDUCATION

**PE 100 Developmental Activities.** Required skills course for male majors in physical education; emphasis on basic motor skills and use of research laboratory. Three times a week. Credit, 1 hour.

**103 Adapted Activities.** Limited activities for students who cannot, because of disabilities, enroll in regular physical education classes. Written recommendation of University physician required. Twice a week. May be repeated for credit. Credit, 1 hour.

**110, 111 Team Sports.** Skills, strategies, knowledge and techniques of officiating major team sports for women. Opportunities to qualify for intramural, associate, local and national ratings. Two lectures, 2 hours laboratory. Credit, 2 hours each semester.

**120 Physical Education Activity.** Instruction in archery, badminton, golf, gymnastics, handball, tennis, swimming, diving and other aquatic activities. Three times a week. May be repeated for credit. Credit, 1 hour.

**161 Introduction to Physical Education.** Orientation to the field of physical education. Required of all freshmen specializing in physical education. Credit, 2 hours.

**162 Occupational and Physical Therapy.** Backgrounds, purposes and functions of the professions of physical therapy and occupational therapy; their relationships to health professions and community agencies. Credit, 2 hours.

**210, 211 Team Sports.** Continuation of PE 110, 111. Two lectures, 2 hours laboratory. Credit, 2 hours each semester.

**220 Physical Education Activity.** Intermediate levels. Continuation of PE 120. Three times a week. May be repeated for credit. Credit, 1 hour.

**250, 251, 252, 253 Professional Activities.** Skills in physical education activities for physical education majors. Three activities may be taken each semester; each activity session of 5 weeks duration, 6 hours each week. Credit, 1 hour per section each semester.

**260 First Aid Instructorship.** For individuals seeking certification as Red Cross First Aid Instructors. Prerequisite: must be 18 years of age and hold current advanced certificate. Credit, 1 hour.

**287 Physical Education for the Atypical Student.** Handicapping conditions found among students and adaptation of exercises and activities to individual needs. Open to all students. Credit, 2 hours.

**320 Physical Education Activity.** Advanced levels. Continuation of PE 220. Includes Red Cross Senior Life Saving, Red Cross Water Safety Instructorship (Prerequisite: Current Senior Red Cross Life Saving Certificate), synchronized swimming and other aquatic activities. Three times a week. May be repeated for credit. Credit, 1 hour.

**344 Methods and Materials in Aquatics.** Methods and materials used to teach beginning, intermediate and advanced aquatics. Credit, 2 hours.

**362 Sports Officiating.** Rules and mechanics of officiating used in football, basketball, baseball and track. Credit, 3 hours.

**364 Theory of Coaching.** Theory and techniques of coaching competitive sports; baseball, gymnastics, swimming, track and field, wrestling and other sports. Each sport meets four hours per week for one-half semester. Prerequisite: professional activity course for applicable sport or approval of instructor. Physical education majors and minors only. Credit, 1 hour.

**365 Theory of Coaching.** Theory and techniques of coaching competitive basketball and football. Each sport meets four hours per week. Prerequisite: professional activity course for applicable sport or approval of instructor. Physical education majors and minors only. Credit, 2 hours.

**366 Physical Education for the Elementary School.** Scope and values of physical education and movement education in the elementary school. Methods, materials and practice in teaching activities for primary, intermediate and upper grades. Credit, 3 hours.

**368 Theory and Practice of Teaching Sports.** Theory and practice in teaching and coaching in the areas of team sports, individual and

dual sports. Analysis of motor skills and acquisition of suitable materials for all school levels. Credit, 3 hours.

**370 Collegiate Sports.** Credit may be given for participation in competitive sports. For men and women. Repeat for credit up to four hours. Time arranged. Credit, 1 hour.

**385 Kinesiology.** Analytic and synthetic studies of body movements. Neuromuscular skills and body mechanics are emphasized. Prerequisite: ZO 201. Credit, 3 hours.

**386 Physiology of Exercise.** Effects of the various types of exercise upon body structure and function. Prerequisite: ZO 202. Credit, 3 hours.

**400 Tests and Measurements in Physical Education.** Analysis and construction of tests, analysis of data and interpretation of measurement in physical education programs. Credit, 2 hours.

**430 Boys' Club Field Experience.** The student is assigned to cooperating Boys' Clubs for a period of 12 weeks, 30 hours a week. To be taken during the fall semester of the senior year. Open only to majors in this program. Credit, 8 hours.

**462 Techniques of Athletic Training.** Emphasizes the screening and conditioning of athletes, prevention, care and treatment of athletic injuries; includes techniques of applying supportive materials and use of therapeutic aids. Prerequisites: ZO 201 and 202. Credit, 3 hours.

**471 Organization and Administration of Intramural Activities.** Principles and practices of the organization of intramural programs. Credit, 2 hours.

**472 Organization and Administration of Physical Education.** Organization and administration of school physical education programs. Curricula, staff, facilities, budget, scheduling and equipment analyzed. Credit, 3 hours.

**480 Methods of Teaching Physical Education.** Methods of instruction, organization and

presentation of appropriate content in physical education. Credit, 3 hours.

**530 Modern Practices in Physical Education.** Current practices, materials and trends of physical education activities and their function in contemporary physical education programs are analyzed and experienced. Credit, 3 hours.

**540 Physiological Bases for Physical Activity.** Immediate and long range adaptations of the body to exercise. Adjustment of selected bodily systems to the stress of muscular activity. Credit, 3 hours.

**545 Principles of Motor Learning.** Learning theories and psychological principles underlying motor learning; motivation, kinesthetic perception, personality, reaction time, stress and individual differences as they influence physical activity. Credit, 3 hours.

**550 Historical Bases of Physical Education.** Cultural-historical development of physical education beginning with the earliest known forms and continuing through the present day programs. Credit, 3 hours.

**552 Philosophy of Physical Education.** Philosophies of physical education and athletics and their effect upon program development. Credit, 3 hours.

**554 Sociological Aspects of Physical Activity.** Development of a theoretical framework and analysis of research relative to cultural-social influences on sport and motor performance; interrelationships among societal forces and types of physical activity and their effect upon the individual and the group. Credit, 3 hours.

**558 Trends and Issues in Physical Education.** Contemporary emphases and developments related to several dimensions of physical education; exploration and examination of current literature and research to enhance understanding of the profession. Credit, 3 hours.

**560 Curriculum Construction in Physical Education.** Application of principles, practices, and functional philosophies of curriculum making in physical education. Prerequisite:

major in physical education or teaching experience. Credit, 3 hours.

**561 Adapted Physical Education.** Contemporary adapted, developmental, remedial and corrective physical education programs; understanding and appreciation of principles, problems and recent developments in this area. Credit, 3 hours.

**563 Planning Facilities in Health, Physical Education and Recreation.** Principles, standards, personnel and designs utilized in the planning, construction and maintenance of outdoor-indoor facilities. Credit, 3 hours.

**564 Improving Performance in Competitive Athletics.** Factors in successful motor performance in skills used in individual, dual and team sports. Ballistic movement, balance, kinesthetics, resistive exercises, spaced activity, laws of learning, physics, kinesiology and physiology of exercise. Credit, 3 hours.

**565 Evaluation in Physical Education.** Skill, knowledge, attitude, motor capacity and classification tests. Opportunity for practical experience in administering the several types of tests. Credit, 3 hours.

**570 Organization and Administration of Athletics.** Managing an athletic program; financing, budget policies, staging and promotion of athletic contests, schedules, travel, insurance and current athletic trends. Credit, 3 hours.

**571 Supervision of School Health and Physical Education.** Trends and practices in the supervision of health and physical education; emphasis on research as it is related to the supervisory functions in the improvement of instruction; its purposes, processes and techniques. Credit, 3 hours.

**575 Theory of Administration in Health, Physical Education and Recreation.** Administrative philosophies; development of concepts related to processes of administration, types of administrative behavior, tasks and responsibilities of the administrator, evaluation of the effectiveness of administration. Credit, 3 hours.

**585 Movement Education.** Structure, function and meaning of human movement experiences. Analysis of theories of movement education as they relate to the curriculum of physical education. Credit, 3 hours.

## RECREATION

**RE 120 Recreational Games and Rhythm.** Games, rhythms and play activities suitable for students majoring in recreation, physical education or elementary education. Field experience included. One lecture, 2 hours laboratory. Credit, 2 hours.

**150 Camp Program Activities and Skills.** Outdoor cookery, nature study, nature crafts, campcrafts, story telling, dramatics, songs and music, overnight trips, shelters, orienting, axemanship, firecraft, food preservation and cooking devices. May include American Camping Association national certification in campcraft skills. Credit, 3 hours.

**260 Recreation in American Life.** History and philosophy of the organized field of recreation. Recreation as related to the use of leisure. Credit, 3 hours.

**262 Program Planning for Recreation.** Principles and practices of planning and conducting recreation programs for playgrounds, community centers and other recreation-serving organizations. Credit, 3 hours.

**362 Recreation Leadership.** Principles, practices, ethics and professional preparation for leadership in the field of recreation. Credit, 3 hours.

**364 Recreation for the Atypical.** Concepts, objectives, methods and settings for recreation for the physically, mentally and emotionally handicapped. May include field trips. Credit, 2 hours.

**370 Public School Camping and Outdoor Education.** Planning and operating a school camping program. Relationship of camping and outdoor education to other educational disciplines. Credit, 3 hours.

**372 Community Recreation Organizations.** Principles, objectives and practices of community organizations and agencies which provide recreation programs. Credit, 2 hours.

**463 Directed Field Experience in Recreation.** Supervised leadership assignments in public or private agency, camp or institution, emphasizing administrative experiences common to organized programs. May be repeated for credit up to 6 hours. Recreation majors only. Credit, 2-6 hours.

**470 Camp Organization and Administration.** Organization and administration of camps. Preparation for camp management; consideration of budget, camp site and personnel. Credit, 2 hours.

**472 Organization and Administration of Recreation.** Administrative structure and organizational policies and practices on the local, state and national level. Analysis of methods of operation, finance, personnel standards and problems, legal aspects and study of modern trends in terms of present and projected community needs. Credit, 3 hours.

**Special Graduate Courses:** 500, 590, 591, 592, 593, 594, 600, 690, 691, 692, 700, 790, 791, 792, 799. (See page 46.)

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## History

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### Professors:

HUBBARD (SS 225G), ADAMS, BARLOW, DANNENFELDT, DUDLEY, KARNES, KRENKEL, SACKS, SERVIN, TILDEN, YOUNG

### Associate Professors:

FULLINWIDER, GIFFIN, KEARNEY, KLEINFELD, PAULSEN, PHILLIPS, SMITH, TAMBS, WOOTTEN

### Assistant Professors:

BURG, FRIEDMAN, KAHN, STOWE, SUSEL, WEINER

### Lecturers:

FIREMAN, NESBY

## Departmental Major Requirements Bachelor of Arts Degree Curriculum

**HISTORY** — Consists of 45 semester hours of credit of which 30 must be in history and 15 in closely related fields to be approved by the advisor in consultation with the student. At least 12 hours in history and six hours in the related fields must be in upper division courses.

**LATIN AMERICAN EMPHASIS** — Consists of 45 semester hours credit, of which 30 must be in history. At least 30 semester hours of the total program must be in Latin American courses, both from within and outside the major field. A reading knowledge of Spanish is required. A reading knowledge of Portuguese is suggested. Fulfillment of requirements is recognized by a bachelor's degree with a major in History-Latin American Studies.

**ASIAN STUDIES EMPHASIS** — Consists of the Bachelor of Arts degree requirements in History plus a minimum of two years of Chinese or Japanese and 30 semester hours of Asian area courses selected with the approval of the departmental advisor. Basic Chinese and Japanese language courses may not be counted within this total. Fulfillment of requirements is recognized by a bachelor's degree with a major in History-Asian Studies.

## Departmental Major Teaching Field Requirements

### Bachelor of Arts in Education Degree Curriculum

**HISTORY** — Consists of 42 semester hours of credit. Courses HI 101, 102, 103, and 104 are required. An additional 30 hours, at least 18 of which must be in history, will be

approved by the advisor in consultation with the student. The course HI 480 may not be counted in the major. At least 18 hours, 12 of which must be in history, must be upper division.

### Departmental Minor Teaching Field Requirements

#### Bachelor of Arts in Education Degree Curriculum

**HISTORY** — Consists of 24 hours of credit in history courses, of which at least nine must be in upper division and at least six must be in American history.

### Departmental Graduate Programs

The Department of History offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

**HI 100, 101, 102 Western Civilization.** Traces origin and development of Western man and his institutions. HI 100, Ancient World through the Middle Ages; HI 101, Renaissance and Reformation through Age of Enlightenment; HI 102, French Revolution to the present. Credit, 3 hours each semester.

**103, 104 The United States.** Growth of the Republic from colonial times, with the first semester covering through the Civil War period and the second continuing to the present. Credit, 3 hours each semester.

**301, 302 Ancient Near East and the Classical World.** First semester, history and civilization of the ancient Orient and Greece; second semester, classical history to the downfall of the Roman Empire. Credit, 3 hours each semester.

**303, 304 American Cultural History.** Culture in a broad connotation including ideas, ideals,

the arts, and social and economic standards. First semester, the nation's colonial background and early national period; second semester, the age of industrialism and modern America. Credit, 3 hours each semester.

**305, 306 Eastern Civilizations.** Features, developments and extensions of the civilizations of the Middle East, India and the Far East analyzed to provide an understanding of this area of growing importance in the world today. First semester, to mid-19th century; second semester, since mid-19th century. Credit, 3 hours each semester.

**321, 322 The Middle Ages.** Political, socio-economic, and cultural development of Western Europe. First semester, Early Middle Ages; second semester, High Middle Ages. Prerequisite: HI 101 or approval of instructor. Credit, 3 hours each semester.

**323, 324 Intellectual History of Modern Europe.** Major political, social, and economic trends in European thought from the Enlightenment to the present. First semester, Enlightenment to mid-19th century; second semester, Marxism to the present. Prerequisite: HI 102 or approval of instructor. Credit, 3 hours each semester.

**325, 326 Diplomatic History of Modern Europe.** First semester, early modern Europe to mid-19th century; second semester, mid-19th century to 1939. Credit, 3 hours each semester.

**327, 328 Economic History of Modern Europe.** Impact of industrialism on the political, social and cultural life of Europe. First semester, Renaissance to the 19th century; second semester, 19th and 20th centuries. Credit, 3 hours each semester.

**329 Social History of Modern Europe.** Impact of various socio-economic groups on 19th and 20th century European society. Credit, 3 hours.

**331 American Colonial History.** Political, economic, social and cultural history of the colonial era. Concentrates on English colonies,

with some consideration of Spanish, French and other colonies. Credit, 3 hours.

**333 The Black American Experience.** The Negro in American history, thought and culture, emphasizing those aspects that were directly influenced by the presence of Negroes. Credit, 3 hours.

**335, 336 Recent American History.** First semester, 1914-1933; second semester, 1933 to the present. Prerequisite: HI 104 or approval of instructor. Credit, 3 hours each semester.

**337, 338 The West in American History.** First semester, the Turner Thesis of the significance of the frontier in American history, beginning with discovery and exploration, and continuing to the period of Texas and the Mexican War; second semester, development of the frontier thesis to 1890, emphasizing Arizona and the Southwest. Prerequisites: HI 103, 104 or approval of instructor. Credit, 3 hours each semester.

**339 The Mexican-American Experience.** Aspects of American history and culture that were directly influenced by the presence of Chicanos. Credit, 3 hours.

**343, 344 Latin America.** First semester, ancient civilization, explorers and conquerors, and colonial institutions; second semester, nationalistic development of the independent republics since 1825. Credit, 3 hours each semester.

**351, 352 England.** Political, economic and social development of the English people. First semester, from the earliest times to the 17th century; second semester, from the 17th century to the present. Credit, 3 hours each semester.

**354 British Constitutional History.** Historical development of the constitutional system of Great Britain from the Middle Ages to the present, emphasizing the growth of democracy. Prerequisites: HI 101, 102 or 351, 352 or approval of instructor. Credit, 3 hours.

**401 Arizona.** Emergence of the state from early times to the present. Credit, 3 hours.

**403, 404 Economic History of the United States.** First semester, Colonial times to 1865; second semester, 1865 to the present. Credit, 3 hours each semester.

**405, 406 American Diplomatic History.** American relations with foreign powers. First semester, 1776-1898; second semester, 1898 to the present. Prerequisites: HI 103, 104 or approval of instructor. Credit, 3 hours each semester.

**407, 408 Constitutional History of the United States.** Origin and development of the American constitutional system. First semester, colonial origins through Reconstruction; second semester, Reconstruction to the present. Prerequisite: approval of instructor. Credit, 3 hours each semester.

**409, 410 American Urban History.** Urban development from colonial times to the present. Considers structural aspects, location trends, distribution and impact on the American economy. Credit, 3 hours each semester.

**411 Recent American Intellectual History.** Development of social thought, literary trends and philosophical theory from 1890 to the present. Credit, 3 hours.

**421 The French Revolution and the Napoleonic Era.** Conditions in France before 1789, the Revolution from 1789 to 1799, the organization of France under Napoleon and the impact of changes in France on European society. Prerequisite: 6 hours of history or approval of instructor. Credit, 3 hours.

**423 Renaissance and Reformation.** Antecedents and developments of the Renaissance in Italy, its spread into the rest of Europe, and the subsequent changes in religious and political thought. Prerequisite: HI 101 or approval of instructor. Credit, 3 hours.

**425, 426 Europe in the 19th Century.** Political, social, economic, and intellectual currents in Europe from Napoleon through World War I. First semester, 1815-1866; second semester, 1866-1918. Prerequisite: 6 hours of history

or approval of instructor. Credit, 3 hours each semester.

**427 Modern France.** France since 1870. Prerequisite: HI 102 or approval of instructor. Credit, 3 hours.

**428 Modern Germany.** German history since 1815. Prerequisite: HI 102 or approval of instructor. Credit, 3 hours.

**429, 430 20th Century Europe.** Europe in its world setting since World War I, emphasizing major political issues. First semester, 1914 to 1945; second semester, 1945 to present. Prerequisite: HI 102 or approval of instructor. Credit, 3 hours each semester.

**431, 432 American Biography.** Considers the noted Americans who made important contributions to United States history. First semester, prior to 1860; second semester, since 1860. Credit, 3 hours each semester.

**433, 434 The Southwest.** First semester, Spanish and Mexican periods to 1848; second semester, American period to the present. Credit, 3 hours each semester.

**435 Early National Period in American History.** Political, social and economic development of the United States from the Revolution to 1828. Prerequisite: HI 103 or approval of instructor. Credit, 3 hours.

**436 Middle Period in American History.** Impact of nationalism, liberalism, and sectionalism upon American life, 1828-1860. Prerequisite: HI 103 or approval of instructor. Credit, 3 hours.

**437 Civil War and Reconstruction.** Analysis of the causes and development of the war; political, constitutional and social issues of reconstruction, and their effects on post-war America. Prerequisite: HI 103 or 104 or approval of instructor. Credit, 3 hours.

**438 Populism and Progressivism.** Political, social, economic and intellectual trends in the United States, 1877-1918. Credit, 3 hours.

**441 Diplomatic History of Latin America.** The struggle for diplomatic recognition, attempts

at political union and participation in international organizations since 1810. Credit, 3 hours.

**442 Brazil.** Discovery, conquest and settlement by the Portuguese; achievement of independence; rise and fall of the empire; problems and growth of the republic to the present. Credit, 3 hours.

**443, 444 Spanish South America.** Political, economic and social developments of the Spanish-speaking nations of South America since independence. First semester, the 19th century; second semester, 20th century developments. Credit, 3 hours each semester.

**445, 446 Mexico.** Political, economic, social and cultural developments. First semester, earliest times to 1810; second semester, 1810 to the present. Credit, 3 hours each semester.

**447, 448 Colonial Latin America.** Political, economic and social institutions during Hispanic rule in America. First semester, Iberian and pre-conquest backgrounds, colonial institutions of the 16th century; second semester, 17th and 18th century developments. Credit, 3 hours each semester.

**449 Intellectual and Cultural History of Latin America.** Main currents of thought, the outstanding thinkers and their impact on 19th and 20th century Latin America. Cultural and institutional basis of Latin American life. Credit, 3 hours.

**451 The British Empire and the Commonwealth.** Growth and development of the British Empire, emphasizing those factors contributing to the transition to the Commonwealth of Nations. Prerequisite: HI 102 or 352 or approval of instructor. Credit, 3 hours.

**452 Tudor and Stuart England.** Political, social, economic and cultural developments which contributed to the forming of the modern world. Prerequisite: HI 101 or 352 or approval of instructor. Credit, 3 hours.

**453 Modern Britain.** Analysis of the factors contributing to Britain's position as the world's leading power in the 19th century and its

decline from that position in the 20th century. Prerequisite: HI 102 or 352 or approval of instructor. Credit, 3 hours.

**454 18th Century England.** Major, social, economic, political, and intellectual trends of the Georgian Era. Prerequisite: HI 102 or 352 or approval of instructor. Credit, 3 hours.

**461 Russia to 1917.** Development of Russian political, economic, social, religious and intellectual institutions and traditions from the 9th century to the Revolution of 1917. Prerequisite: HI 102 or approval of instructor. Credit, 3 hours.

**462 The Soviet Union.** Development of the Soviet system since the Revolution of 1917, emphasizing its Russian, European, Asian and global significance. Prerequisite: HI 102 or approval of instructor. Credit, 3 hours.

**463 Modern Italy.** Major political, economic, social, religious and cultural developments from national unification to the present. Credit, 3 hours.

**465, 466 Eastern Europe and the Balkans.** Eastern and southeastern European countries from movements for national independence. First semester, 1820 to World War I; second semester, 1914 to the present. Credit, 3 hours each semester.

**467, 468 Early Modern Europe.** Social, economic, cultural and political changes in 17th and 18th century Europe. First semester, 17th century; second semester, 18th century. Prerequisite: HI 101 or approval of instructor. Credit, 3 hours each semester.

**471, 472 Diplomatic History of East Asia.** Foreign relations of China, Japan and Korea. First semester, Opium War to 1895; second semester, 1895 to the present. Credit, 3 hours each semester.

**473, 474 China.** Political, economic, social and cultural history of the Chinese people. First semester, early times to the 19th century; second semester, 19th century to the present. Prerequisite: approval of instructor. Credit, 3 hours each semester.

**477, 478 Japan.** Political, economic, social and cultural history of the Japanese people. First semester, early times to the 19th century; second semester, 19th century to the present. Prerequisite: approval of instructor. Credit, 3 hours each semester.

**480 Methods of Teaching History.** Methods of instruction, organization and presentation of the subject matter of history and closely allied fields. Credit, 3 hours.

**482 Modern India.** India from the Mogul Empire to the present, emphasizing the impact of British ideas on Indian life and the subsequent growth of nationalism, development of Hindu-Muslim antagonism and its problems after independence. Prerequisite: approval of instructor. Credit, 3 hours.

**500 Research Methods.** Credit, 3 hours.

**512 European Historiography.** Methods and theories of writers of ancient and European history. Credit, 3 hours.

**513 American Historiography.** Methods and theories of writers of United States history. Credit, 3 hours.

**514 Latin American Historiography.** Methods and theories of writers of Latin American history. Credit, 3 hours.

**580 Practicum.** Methods and subject matter instruction in history. Functions and responsibilities of college teaching. Required of and open only to teaching assistants. Credit, 1 hour.

**591 Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) United States History
- (b) Arizona History
- (c) European History
- (d) British History
- (e) Latin American History
- (f) East Asian History

**Special Graduate Courses:** 500, 590, 591, 592, 593, 799. (See pages 46-47.)

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## Home Economics

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### Professors:

BRESINA (HEc 106), BARKLEY, ELLSWORTH,  
KAGY, MORGAN, RANNELLS

### Associate Professors:

HOOVER, STANGE, STREUFERT

### Assistant Professors:

BATES, HOGAN, HUNTER, O'CONNOR,  
PETERS, WOOLDRIDGE

The Department of Home Economics offers curriculums leading to a Bachelor of Arts, Bachelor of Science, or Bachelor of Arts in Education degree with a major in Home Economics with six areas of emphasis: clothing, textiles and related art; family life and child development; foods and nutrition; home economics in business; home economics education, and general home economics. Students who elect the area of concentration related to business with emphasis in foods and equipment are prepared for employment in the home economics departments of food processors, equipment manufacturers and public utilities; those in clothing and textiles, for fashion merchandising and consumer service. Both areas prepare students for advertising and publicity agencies, newspapers and magazines.

### Center for Family Life Studies

The Center for Family Life Studies is an educational, research and service agency of the University within the College of Liberal Arts and administratively related to the Department of Home Economics. The purpose of the Center is to coordinate and

highlight programs which develop and foster the understanding of family life from an interdisciplinary point of view. Both academic courses and special programs for the academic and professional communities as well as for the general public are developed and carried out by the Center. Policies and programs of the Center are guided by an interdepartmental advisory committee.

### **Departmental Major Requirements Bachelor of Arts Degree Curriculum**

HOME ECONOMICS – Consists of 45 semester hours of credit of which not more than 30 may be in home economics and at least 15 in related fields to be approved by the advisor in consultation with the student. Courses MF 231, 254 are required. The remaining courses will be determined by the advisor in consultation with the student depending on the area of emphasis. At least 20 semester hours of credit must be in upper division courses.

### **Bachelor of Science Degree Curriculum**

HOME ECONOMICS – Consists of 50 semester hours of credit of which at least 20 must be in upper division courses. MF 231, 254 are required. The remaining courses will be determined by the advisor in consultation with the student, depending on the area of emphasis.

Students who satisfactorily complete the requirements for this degree with emphasis in foods and nutrition can qualify for entrance to training centers in institution management and hospital dietetics as approved by the American Dietetics Association.

### **Departmental Major Teaching Field Requirements**

#### **Bachelor of Arts in Education Degree Curriculum**

HOME ECONOMICS – Consists of 42 semester hours of credit in home economics. At least 18 semester hours of credit must be in upper division courses. The home economics core (MF 231, 254) must be taken. Other courses are specified according to the option chosen by the student. A broad major of 60 hours is possible with the minor in home economics or a minor of 24 hours may be chosen outside the department. A life science is required and CH 101 or 113 must be taken during the first two years.

Students enrolled in this major meet requirements for a vocational certificate and are qualified for Cooperative Extension Service.

### **Departmental Minor Teaching Field Requirements**

A general minor in home economics of 24 hours is offered but specialized minors can be worked out with a home economics education advisor.

### **Departmental Graduate Programs**

The Department of Home Economics offers programs leading to the degree of Master of Science. Consult the *Graduate Catalog* for requirements.

#### **CHILD DEVELOPMENT**

**CD 232 Child Development.** Development from conception through later childhood. Significance of family membership. Recognition of individuality within the universal pattern of

human development. Guided observations. Prerequisites: PX 100, SO 101 or equivalent. Credit, 3 hours.

**337 Nursery School Education.** Participation in the University nursery school. Discussion and application of methods for guiding children in activities related to learning experiences for young children. Prerequisite: CD 232 or course in psychology. Two lectures, 3 hours laboratory. Credit, 3 hours.

**432 The Meaning of Play.** Observation, analysis and interpretation of play activities in relation to the development of the child. Prerequisite: CD 232 or EE 313 or approval of instructor. Credit, 3 hours.

**433 Enrichment Activities for the Young Child.** Methods of relating art, literature, music and science activities to learning experiences of the nursery school child. Involves practicum. Prerequisite: CD 232. Credit, 3 hours.

**434 Organization and Administration of Pre-schools.** Curriculum planning and evaluation of existing and proposed programs in relation to recommended standards and needs of the child, family and community. Prerequisite: CD 337 or approval of instructor. Credit, 3 hours.

**456 Parent-Adolescent Relationships.** Dynamics of the relationships between parents and their adolescent children in different segments of the American culture today. Developmental characteristics of adolescence and the corresponding adult stage. Prerequisites: CD 232, MF 331 or equivalent. Credit, 3 hours.

**531 Advanced Child Development.** Theory and research relating to the development of children in the family. Prerequisite: CD 232 or CE 522 or approval of instructor. Credit, 3 hours.

**532 Behavior of Young Children.** Understanding developmental problems occurring most frequently in early childhood. Survey of recent literature. Prerequisite: CD 232 or course in psychology or approval of instructor. Credit, 3 hours.

### DECORATIVE ARTS

**DA 171 Introduction to Decorative Arts.** Accessories in environmental design. Psychological and sociological responses related to elements of design and integrity of materials. Credit, 3 hours.

**371 Decorative Textiles.** Evolution of design, production and performance of textile furnishings reflecting cultural influence on environmental design. Prerequisites: DA 171 or equivalent, AH 111 or 212. Credit, 3 hours.

**373 Home Furnishings.** Furnishings designed for the home. Coordinating human values with esthetic, functional and economic qualities. Prerequisite: DA 171 or approval of instructor. Credit, 3 hours.

**376 Professional Practice.** Experience in executing environmental design problems for clients under the direction of professional designers and advisors. Prerequisite: DA 373. Application must be made preceding semester. Credit, 3 hours.

**474 History of Interior Furnishings.** Focus on furnishings designed to meet cultural needs from antiquity to the present day. Prerequisite: DA 171 or equivalent. AH 111 and 212. Credit, 3 hours.

### FAMILY RELATIONSHIPS

**MF 231 Personal Adjustment for Family Living.** Personal development and behavior as related to competency in interpersonal relationships within the family. Processes of family interaction. Prerequisites: SO 101, PX 100 or equivalent. Credit, 3 hours.

**254 Management in the Family.** Integrated nature of management as a means to realization of individual and family values and goals; creation, allocation and utilization of resources. Focus on decision-making. Prerequisites: SO 101, PX 100 or equivalent. Credit, 3 hours.

**331 Family Relationships.** Issues, challenges

and opportunities relating to present-day family living. Factors influencing interrelations within the family. Prerequisite: course in psychology or sociology. Credit, 3 hours.

**354 Consumer Economics.** Relationship of the consumer to the economy as a determinant of the family pattern of living. Current consumer problems and sources of protection. Credit, 3 hours.

**435 Advanced Family Relationships.** Conceptual approaches to the study of the family. Special problems in interrelations within the family as affected by family composition, physical environment, family patterns and values. Prerequisite: MF 331. Credit, 3 hours.

**454 Family Financial Management.** Major family income and expenditure alternatives in attainment of family goals. Credit, 3 hours.

**457 Home Management.** Laboratory application of management concepts. Observation, analysis and interpretation of management in families. Prerequisite: MF 254. Credit, 2 hours.

**534 Understanding the Family Through Literature.** Family relationship processes and experiences through study of literary accounts of family life. Prerequisite: MF 331 or equivalent. Credit, 2 hours.

**535 Family Relationships in the Middle and Later Years.** Developmental processes and generational relationships of the family in the middle and later stages of the family life cycle. Prerequisites: CD 232, MF 331 or approval of instructor. Credit, 3 hours.

**536 Family Crises and Resources.** Special problems encountered in the family. Individual and community resources for approaching them. Prerequisites: MF 231, CE 522 or equivalent. Credit, 2 hours.

**537 Individual Development in the Family Milieu.** The family as a framework for human development. Reciprocal influences between individual and family development. Prerequisites: CD 232, MF 331. Credit, 3 hours.

**538 Approaches to Marriage and Family Coun-**

**seling.** Methods currently used in marriage and family counseling and consideration of theoretical bases underlying the methods. Prerequisite: approval of instructor. Credit, 3 hours.

**539 Developmental Approach to Understanding Human Sexuality.** Sexuality in the broader framework of human development and basic human values from an interdisciplinary point of view. Prerequisite: approval of instructor. Credit, 3 hours.

**551 Advanced Home Management.** Management concepts and research findings applied to problems of modern families. Prerequisite: MF 254. Credit, 2 hours.

### FOOD AND NUTRITION

**FN 141 Elementary Nutrition.** Principles of nutrition, diet, food in its relation to health. Credit, 2 hours.

**142 Applied Food Principles.** Scientific principles and nutrition related to selection, preparation and care of food. Designed for majors and nonmajors. One lecture, 4 hours laboratory. Credit, 3 hours.

**341 Meal Management.** Management in meal planning, preparation and service for today's families. Social and cultural aspects of foods. Prerequisites: FN 141, 142 and HO 153. Two lectures, 3 hours laboratory. Credit, 3 hours.

**343 Quantity Food Production.** Standard methods of food preparation in quantity; operation of institutional equipment, menu planning for institutions. Experience in quantity food service. Prerequisite: FN 341. One lecture, 6 hours laboratory. Credit, 3 hours.

**441 Advanced Nutrition.** Special problems in diet and nutrition. Prerequisites: FN 141, CH 101. Credit, 3 hours.

**442 Experimental Foods.** Experimental study of foods; investigation of current research. Prerequisites: FN 142, CH 231. Two lectures, 3 hours laboratory. Credit, 3 hours.

**443 Child Nutrition.** Nutritional needs from prenatal development through adolescence; food requirements, feeding practices and indices of nutritional status. Prerequisites: FN 141, CD 232 or approval of instructor. Credit, 2 hours.

**444 Diet Therapy.** Methods of adapting, modifying and applying normal nutrition principles to abnormalities of metabolism. Prerequisites: FN 341, 441 or approval of instructor. Credit, 3 hours.

**445 Institutional Food Service.** Organization, administration and management of food service in hospitals and institutions. Prerequisite: FN 343. One lecture, 4 hours laboratory. Credit, 3 hours.

**446 Institutional Food Purchasing.** Food purchasing for institutions; understanding of cost factors, food laws, quality standards and basic manufacturing processes. Prerequisite: FN 343. Two lectures, 3 hours laboratory. Credit, 3 hours.

**447 Classical Cuisine.** Art and appreciation of international epicurean foods accompanied by preparation and appropriate service; effect of the economy, geography, history and culture on food. Prerequisite: FN 341. Three hours a week. Credit, 2 hours.

**448 Community Nutrition.** Survey and evaluation of current nutrition problems of population groups. Application of principles of learning to nutrition education. Prerequisites: FN 141, SO 101. Credit, 3 hours.

**449 Geriatric Nutrition.** Nutritional needs, practices and programs for aging individuals. Prerequisite: FN 141 or approval of instructor. Credit, 2 hours.

**462 Home Economics in Business.** Organization and scope of home economics departments in businesses related to foods and equipment. Field trip to Los Angeles required. Credit, 2 hours.

**541 Recent Developments in Nutrition.** Recent research in nutrition with view of finding prac-

tical applications. Prerequisites: FN 141, CH 101. Credit, 2 hours.

**542 Advanced Experimental Foods.** Group and individual research in food preparation. Prerequisites: FN 442, CH 231. One lecture, 5 hours laboratory. Credit, 3 hours.

**548 Recent Developments in Foods.** Recent developments in the food field which affect the food supply. Prerequisites: FN 341, CH 101. Credit, 2 hours.

### HOME ECONOMICS EDUCATION

**HO 153 Household Equipment.** Principles of construction, operation, selection and effective use of home equipment. Two lectures, 2 hours laboratory. Credit, 3 hours.

**401 Vocational Education in American Schools.** Basic principles and philosophies of vocational education. Relationship of vocational education to general education, history and legislation. Credit, 3 hours.

**451 Field Study.** Supervised experience with business firms or service institutions in accordance with prevailing employment conditions, major interests and readiness of student. Credit, 3 hours.

**452 Housing.** Family housing as affected by legislation, life cycle, physical and psychological needs, with application to modern housing. Credit, 3 hours.

**453 Advanced Household Equipment.** Experimental investigations of major appliances. Focus on current trends. Prerequisite: HO 153. Two lectures, 2 hours laboratory. Credit, 3 hours.

**454 Kitchen Design.** Design principles applied to kitchen planning emphasizing physiological and psychological aspects. Credit, 3 hours.

**461 Demonstration Techniques.** Principles and techniques of demonstration. Experience before audiences. Six hours a week. Credit, 3 hours.

**480 Methods of Teaching Home Economics.** Methods and techniques of instruction, depart-

mental organization and professional activities. Prerequisite: SE 411 or concurrently. Credit, 3 hours.

**481 Teaching Occupational Home Economics.** Planning and organizing instruction designed to meet vocational requirements. Credit, 3 hours.

**582 Evaluation in Home Economics.** Procedures used in the broad content of evaluation, including the construction of evaluative devices and use of selected standardized instruments. Prerequisite: HO 480 or equivalent. Credit, 3 hours.

**583 Recent Trends in Home Economics Education.** Socio-economic and technological developments affecting home economics education with implications for teaching. Prerequisite: HO 480 or equivalent. Credit, 3 hours.

### TEXTILES AND CLOTHING

**TC 122 Clothing and Man.** Appropriate clothing for individuals, emphasizing design and human behavior. Credit, 3 hours.

**123 Clothing Construction.** Construction processes of various fabrics and fashions, study and use of commercial patterns. One lecture, 4 hours laboratory. Credit, 3 hours.

**222 Textiles.** Introduction to textile fibers, structures and finishes, emphasizing performance characteristics, end use applications, and care. Prerequisite: CH 101. Two lectures, 2 hours laboratory. Credit, 3 hours.

**321 Pattern Designing.** Flat patterns used to develop fundamental principles in designing individualized garments. Prerequisites: TC 122, 123. Two lectures, 4 hours laboratory. Credit, 3 hours.

**327 Clothing the Family.** Analysis of clothing needs of men, women and children at various stages of the life cycle. Credit, 3 hours.

**422 Applied Dress Design.** Creative interpretation of dress design developed through the media of draping. Prerequisites: TC 122, 123.

Two lectures, 4 hours laboratory. Credit 3 hours.

**423 Clothing Technique Problems.** Problems involving techniques used in tailored apparel. Prerequisites: TC 123, 321. Two lectures, 4 hours laboratory. Credit, 3 hours.

**424 History of Costume.** Evolution of costume from ancient Egypt to present day. Prerequisite: TC 122. Credit, 3 hours.

**426 The Clothing and Textile Industries.** Organization, economics and marketing problems and practices specific to the textile and clothing industries. Prerequisite: MK 321. Credit, 3 hours.

**428 Textile and Clothing Appraisal.** Problems which affect the consumer in the production, distribution and consumption of textile products. Prerequisite: TC 222. Credit, 2 hours.

**429 Advanced Textiles.** Introduction to textile research and the evaluation of data. An individual problem. Prerequisites: TC 222, CH 101 or approval of instructor. One lecture, 4 hours laboratory. Credit, 3 hours.

**521 Recent Developments in Textiles.** Current developments in the field as reported in technical journals. Prerequisite: TC 222. Credit, 2 hours.

**522 Advanced Dress Design Analysis.** Use of a foundation pattern as a basis for interpreting new designs. Prerequisite: TC 321. Credit, 3 hours.

**523 Socio-Psychological Aspects of Clothing.** Application of socio-psychological theories to the selection and use of clothing. Prerequisites: TC 122, SO 101, PX 100, EC 201. Credit, 3 hours.

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## Mass Communications

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**Professors:**

BROWN, ZACHER

**Associate Professors:**

MILNER (ASB 304), ELLIS

**Assistant Professors:**

BENNETT, FERRELL, LANCE

**Instructor:**

ZESBAUGH

### Departmental Major Requirements

#### Bachelor of Arts Degree Curriculum

**JOURNALISM** — Consists of 45 semester hours of credit of which 30 must be in mass communications and 15 in closely related fields to be selected in consultation with the advisor. The 30 hours include MC 110, 211, 212, 312, 313 and 314. AD 301 is required as a related field course.

**RADIO-TELEVISION** — Consists of 45 semester hours of credit of which 30 must be in mass communications and 15 in closely related fields to be selected in consultation with the advisor. The 30 hours include MC 110, 200, 211, 312, 332 and 336. AD 301 is required as a related field course.

#### Bachelor of Science Degree Curriculum

**JOURNALISM** — Consists of a minimum of 51 semester hours of credit of which 33 must be in mass communications and 18 in closely related fields to be selected in consultation with the advisor. The 33 hours include MC 110, 211, 212, 312, 313 and 314. Related field courses must include AD 301 and at

least 9 hours from one of the following fields: Advertising, Economics, Graphic Arts, Home Economics or Political Science.

**RADIO-TELEVISION** — Consists of a minimum of 51 semester hours of credit of which 33 must be in mass communications and 18 in closely related fields to be selected in consultation with the advisor. The 33 hours include MC 110, 200, 211, 312, 332 and 336. Related field courses must include AD 301 and at least 9 hours from one of the following fields: Advertising, Home Economics, Management, Political Science or Speech and Theatre.

### Departmental Major Teaching Field Requirements

#### Bachelor of Arts in Education Degree Curriculum

**JOURNALISM** — Consists of 45 semester hours of credit. Courses MC 110, 211, 212, 313, 320 and 480 are required. An additional 28 hours, including at least 19 in mass communications, will be approved by the advisor in consultation with the student. The remaining courses may be in closely related fields.

### Departmental Minor Teaching Field Requirements

**JOURNALISM** — Consists of 24 semester hours of credit. Courses MC 110, 211, 212, 313 and 480 are required. The remaining courses are to be selected in consultation with a journalism advisor.

**MC 110 Mass Communications.** Functions and practices of newspapers, magazines, radio and television; laboratory practice in writing for the mass media. Typing ability required. Two lectures, 2 hours laboratory. Credit, 3 hours.

**120 Mass Media and Society.** The role of newspapers, magazines, radio, television and motion pictures. Not open to mass communications majors. Credit, 3 hours.

**200 Fundamentals of Radio-Television.** Organization of broadcast stations; facilities, personnel and practices of radio and television. Prerequisite: MC 110. Credit, 3 hours.

**211 Reporting.** Study and practice in the coverage and writing of news; structure of the news story; laboratory practice. Prerequisite: MC 110. One lecture, 4 hours laboratory. Credit, 3 hours.

**212 Advanced Reporting.** Main types and sources of news; interviewing and beat coverage; laboratory, and State Press experience. Prerequisite: MC 211. One lecture, 4 hours laboratory. Credit, 3 hours.

**232 Radio-Television Announcing.** Techniques of radio and television announcing. Prerequisite: MC 110 and approval of instructor. One lecture, 4 hours laboratory. Credit, 3 hours.

**300 Cinema in Mass Communications.** The motion picture as a mass medium. Credit, 3 hours.

**311 News Photography.** Instruction with field and laboratory practice in camera and dark-room techniques for newspaper and magazine photographic work. Prerequisite: MC 110 or approval of instructor. One lecture, 4 hours activity. Student should have own camera. Credit, 3 hours.

**312 Communications Law.** Legal aspects of the rights and responsibilities of the press, radio and television; basic features of the law of libel, privilege, copyright, access to information; background of court reporting. Prerequisite: six hours in Mass Communications or approval of instructor. Credit, 3 hours.

**313 Editing and Make-up.** Copyreading and headline writing; principles of typography and make-up. Laboratory practice. Prerequisite: MC 212. One lecture, 4 hours laboratory. Credit, 3 hours.

**314 History of Communications.** American

journalism from its English and colonial origins to the present day. Development and influence of newspapers, magazines, radio, television and news gathering agencies. Credit, 3 hours.

**315 Radio-Television News.** Techniques and practice of writing and editing press association and local news copy for radio and television news broadcasts; laboratory practice in preparation of news programs. Prerequisite: MC 211. Credit, 3 hours.

**320 Staff Activity.** Practical professional experience and responsibility in production of a newspaper. The University newspaper, the State Press, is used as the laboratory or work project. Prerequisite: MC 313. Credit, 2 hours.

**321 Television Drama.** Production of television drama. Credit, 3 hours.

**332 Radio-Television Programming.** Radio and television programming patterns, regulations pertaining to broadcasting and responsibilities of broadcasters. Prerequisite: MC 200. Credit, 3 hours.

**336 Television Production.** Planning, staging and presentation of television programs. Prerequisite: MC 200 or approval of instructor. One lecture, 4 hours laboratory. Credit, 3 hours.

**337 Television Directing.** Directing television programs. Prerequisite: MC 336. One lecture, 4 hours laboratory. Credit, 3 hours.

**340 Magazine Writing.** Writing and marketing magazine articles for publication. Prerequisite: MC 110 or approval of instructor. Credit, 3 hours.

**401 Public Relations Techniques.** Publicity methods; how to communicate through newspapers, magazines, radio-television stations and other media. Prerequisite: MC 211 or approval of instructor. Credit, 2 hours.

**411 Special Assignment.** Selection and performance of a major project or projects on an individual basis. Prerequisite: approval of instructor. Credit, 2 to 3 hours.

**412 Editorial Interpretation.** The press as an influence upon public opinion. The editorial in analyzing and interpreting current events. Prerequisite: MC 211. Credit, 2 hours.

**413 Advising High School Publications.** Designed for high school publication advisors. Problems of newspaper and yearbook staffs. Credit, 2 hours.

**421 News Problems.** Trends and problems of the news media, emphasizing editorial decisions in the processing of news. Prerequisite: eight hours in mass communications or approval of instructor. Credit, 3 hours.

**430 International Communications.** Comparative study of press and broadcasting systems in foreign countries. Problems of news gathering and dissemination in other cultures and under different forms of government. Credit, 3 hours.

**431 Radio-Television Writing.** Principles and techniques of writing for radio and television. Credit, 3 hours.

**433, 434 Radio-Television Station Operation.** Program planning, traffic, music, news, continuity and promotion; assignments in actual operations. Prerequisite: MC 332 and approval of instructor. Credit, 2 hours each semester.

**472 Radio-Television Station Management.** Organization, procedures and policies of radio-television stations. Financial and creative aspects of station operation. Personnel and production problems, relationship with advertising agencies, networks and sponsors. Prerequisites: AD 301; MC 332. Credit, 3 hours.

**480 Methods of Teaching Journalism.** Methods of instruction, organization and presentation of appropriate content in journalism. Prerequisite: six hours of journalism. Credit, 3 hours.

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## Mathematics

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**Professors:**

SAVAGE (PS A-216), BUNT, FREUND,  
GRACE, JACOBOWITZ, KELLY, NERING,  
SCOTT, SINKOV, SMITH, WEXLER

**Associate Professors:**

FELDSTEIN, GOLDSTEIN, KURTZ,  
LYON, SANSONE, SHERMAN, WANG

**Assistant Professors:**

ANDERSON, BEDIENT, FARMER, HASSETT,  
LEONARD, LISKOVEC, LIVERMORE,  
McCARTER, McDONALD, J. D. MOORE,  
N. MOORE, NIELSON, PECK, STEWART,  
SWIMMER, WEISS

**Instructors:**

LAKE, THOMPSON

### Departmental Major Requirements

#### Bachelor of Arts Degree Curriculum

MATHEMATICS – Consists of 45 semester hours of which 30 must be in mathematics and the remaining hours in closely related fields to be approved by the advisor in consultation with the student. The required 30 hours must include MA 120, 121, 212, 342 or 442, and 370. Courses taken to satisfy the remaining requirement of 9 hours in mathematics must include choices from three of the seven groups listed below. In addition, the department recommends a computer science course, such as MA 337 or 338, and a year's sequence of courses (for example, PH 115, 116) in some closely related field.

The student who plans to do graduate work in mathematics should take MA 442, 443, 450 and 470 and is advised to choose his

foreign language from among French, German and Russian.

**Geometry:**

MA 404, 408, 410

**Probability and Statistics:**

MA 424, 425, 426, 427

**Set Theory and Logic:**

MA 430, 432, 434, 436

**Algebra:**

MA 442, 443, 444, 445, 446, 447

**Applied Analysis:**

MA 460, 461, 462, 463

**Numerical Analysis:**

MA 464, 465

**Analysis:**

MA 450, 470, 471, 474, 475

#### Bachelor of Science Degree Curriculum

MATHEMATICS – Consists of 45 to 55 semester hours of which at least 39 must be in mathematics and the remaining hours in closely related fields to be approved by the advisor in consultation with the student. The required 39 hours must include MA 120, 121, 212, 342 or 442, and 370. Courses taken to satisfy the remaining requirement of 18 hours in mathematics must be upper division courses and must include choices from at least four of the seven groups listed above. In addition, the following are required: (a) a year's sequence of courses (for example, PH 115, 116) in some closely related field; (b) a knowledge of one foreign language equivalent to the level obtained through 8 hours of instruction in the elementary courses on the college level as demonstrated by either course work or the passing of a proficiency examination given by the Department of Foreign Languages.

The student who plans to do graduate work in mathematics should take MA 442, 443, 450 and 470 and is advised to choose his foreign language from among French, German and Russian. The department recommends that all students take a computer science course, such as MA 337 or 338.

### Departmental Major Teaching Field Requirements

#### Bachelor of Arts in Education Degree Curriculum

MATHEMATICS – *Option 1.* Consists of 36 to 42 semester hours of credit. Required courses are MA 120, 121, 212, 307, 342, 370, 443, 483 and a computer science course. MA 484 is required, exclusive of the major requirement, as part of a 25-hour professional education requirement.

*Option 2.* Consists of at least 30 semester hours of credit. Required courses are MA 120, 121, 212, 307, 342, 370 and 443. This option may be exercised only in combination with Option 2 in Chemistry or Physics. A computer science course is recommended.

### Departmental Minor Teaching Field Requirements (Secondary Education)

MATHEMATICS – Consists of 24 semester hours of credit. MA 120, 121, 212, 307, 342 and 370 are required.

### Departmental Graduate Programs

The Department of Mathematics offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

**MA 116 Intermediate Algebra.** A remedial, no-credit course made available for students requiring an extensive review of high school algebra before enrolling in MA 117 or MA 141. Fees and academic load based on a 3-hour course. Credit, none.

**117 College Algebra.** A pre-calculus course designed for preparation of students in topics in algebra and properties of elementary functions essential to the study of analytic geometry and calculus. Prerequisite: three semesters of high school algebra or MA 116. Credit, 3 hours.

**118 Plane Trigonometry.** Review of fundamental concepts of algebra and geometry, measures of angle, properties and graphs of the trigonometric functions, fundamental identities, addition and half angle formulas, inverse trigonometric functions, principles of triangle solution, solution of trigonometric equations, complex numbers. Prerequisite: three semesters of high school algebra or MA 116. Credit, 2 hours.

**120 Analytic Geometry and Calculus I.** Differential and integral calculus of elementary functions together with presentation of topics from analytic geometry essential to the study of calculus. Prerequisite: MA 117 or 141, or equivalent. Credit, 5 hours.

**121 Analytic Geometry and Calculus II.** Techniques of integration, further applications of the calculus, partial differentiation, vector functions. Prerequisite: MA 120 or equivalent. Credit, 5 hours.

**141 Mathematical Analysis I.** Presentation of topics in algebra, plane trigonometry and coordinate geometry, of interest to students with majors in architecture, social sciences, business and other areas. Comparable in content with MA 117 and 118. Not for students who have completed MA 117 or 118. Prerequisite: three semesters of high school algebra or MA 116. Credit, 4 hours.

**142 Mathematical Analysis II.** Differential and integral calculus of elementary functions, with applications. Not for students who have

taken MA 120. Prerequisite: MA 141 or equivalent. Credit, 3 hours.

**180 Theory of Arithmetic.** Number systems and theory of elementary arithmetic. Recommended for those intending to teach in elementary schools. Credit, 3 hours.

**205 The Creative Art of Mathematics.** Designed to acquaint students in the arts, humanities and social sciences with the nature of modern mathematics and the mathematical method. Recommended for those students electing a single mathematics course. Credit, 3 hours.

**212 Analytic Geometry and Calculus III.** Multiple integration, infinite series; solution of ordinary differential equations, numerical methods, Laplace transforms, existence and uniqueness of solutions. Prerequisite: MA 121 or equivalent. Credit, 5 hours.

**226 Elements of Statistics.** Basic concepts and methods of statistics, including descriptive statistics, significance tests, estimation, sampling and correlation. Not open to majors in mathematics or the physical sciences. Prerequisite: three semesters of high school algebra or MA 116. Credit, 3 hours.

**235 Introductory Computer Science.** A survey course. How computers work, communicating with computers, areas of application and significance, simple programming languages, elementary data processing. Two lectures, 2 hours laboratory. Credit, 3 hours.

**243 Mathematics for the Social, Life and Management Sciences.** Topics from set theory, probability and linear algebra. Prerequisite: MA 142 or equivalent. Credit, 3 hours.

**260 Differential Equations.** Solution of ordinary differential equations, numerical methods, Laplace transforms, existence and uniqueness of solutions. Not for students who have taken MA 212. Prerequisite: MA 121. Credit, 3 hours.

**307 Introduction to Geometry.** Congruence, area, parallelism, similarity and volume. Euclidean and non-Euclidean geometry. Prerequisite: MA 121. Credit, 3 hours.

**334 Abstract Computing Machines.** Automata, Turing machines, algorithms and effective computability, limits of effective computability, symbol manipulation systems. Prerequisite: MA 342 or approval of instructor. Credit, 3 hours.

**337 Foundations of Digital Computers.** Fundamentals of digital computer organization. Theoretical principles of machine design leading to computer operation and machine language programming. Algorithms and programming techniques. Prerequisite: MA 121 or 235. Two lectures, 2 hours laboratory. Credit, 3 hours.

**338 Programming and Algorithms for Digital Computers.** Construction of algorithms, flow charting, instruction and experience in the use of at least one procedure-oriented language, survey of other procedure-oriented languages, advanced programming techniques, machine learning. Prerequisite: MA 121 or 235. Two lectures, 2 hours laboratory. Credit, 3 hours.

**342 Introduction to Linear Algebra.** Linear equations and matrices, vector spaces and linear transformations, quadratic forms and characteristic values. Prerequisite: MA 121 or 142, or approval of instructor. Credit, 3 or 4 hours.

**362 Advanced Mathematics for Engineers.** Topics from vector algebra, vector calculus, Fourier series and partial differential equations. Emphasis on techniques of problem solving. Prerequisite: MA 212 or 260. Credit, 3 hours.

**370 Introduction to Analysis.** Elements of real analysis, emphasizing fundamental concepts such as the real number system, limits and continuity, differentiation. Prerequisite: MA 212. Credit, 3 or 4 hours.

**380, 381 Mathematics in the Elementary School.** Arithmetic and geometry. Prerequisite for MA 380: MA 180; for MA 381: MA 380. Credit, 3 hours each semester.

**404 Projective Geometry.** Projective geometry and its relationship to Euclidean and other

geometries. Prerequisite: MA 307 recommended; MA 342 or 442 required. Credit 3 hours.

**408 Differential Geometry.** Geometry of curves and surfaces in Euclidean 3-space with extensive use of linear algebra. Prerequisites: MA 342 and 370 or approval of instructor. Credit, 3 hours.

**410 Introductory Topology.** Topology of the real numbers, equivalence of sets, transfinite induction. Designed to develop the student's critical faculties and creative abilities in mathematics. Prerequisite: MA 370. Credit, 3 hours.

**424 Probability I.** Probability spaces, combinatorial analysis, random variables, expectation, central limit theorem, moment generating functions. Prerequisite: MA 370. Credit, 3 hours.

**425 Probability II.** Markov chains, stationary distributions, pure jump processes, second order processes and other topics in stochastic processes. Prerequisites: MA 424 and either 342 or 442. Credit, 3 hours.

**426 Mathematical Statistics I.** Laws of probability, random variables, probability distribution and density functions, expected values and moments, conditional probability, stochastic independence, distributions of functions of random variables. Prerequisite: MA 212. Credit, 3 hours.

**427 Mathematical Statistics II.** Limiting distributions, interval estimation, point estimation, sufficient statistics, tests of hypotheses. Prerequisite: MA 426. Credit, 3 hours.

**430 Mathematical Logic.** Propositional calculus, first order theories, first order predicate calculus, consistency and completeness, Godel's theorems. Prerequisites: MA 342 and 370, or approval of instructor. Credit, 3 hours.

**432 Theory of Sets.** Equivalence relations and partitions, similarity mappings, ordinal numbers, cardinal numbers, well ordering theorem, equivalents of the axiom of choice, axiomatic set theory. Prerequisites: MA 342 and 370 or approval of instructor. Credit, 3 hours.

**434 Computability and Unsolvability.** Turing machines and computability, computable and partial computable functions, recursive sets and predicates, recursively enumerable sets, unsolvable decision problems, applications. Prerequisites: MA 342 and 370 or approval of instructor. Credit, 3 hours.

**436 Mathematical Linguistics.** Theory of grammar, methods of syntactic analysis and specification, types of artificial languages, relationship between formal languages and automata. Prerequisite: MA 342 or 442. Credit, 3 hours.

**442 Advanced Linear Algebra.** Deeper study of the topics in MA 342 and additional topics selected from following list: invariant subspaces, canonical forms of matrices, minimal polynomials, linear programming, and multi-linear algebra. Prerequisite: MA 362 or 370 or approval of instructor. Credit, 3 hours.

**443 Abstract Algebra I.** Basic introduction to the most important algebraic structures including groups, rings, integral domains and fields. Prerequisites: MA 370 and either 342 or 442. Credit, 3 or 4 hours.

**444 Abstract Algebra II.** Continuation of MA 443 with a study of unique factorization domains, modules and fields, together with applications of abstract algebra to various branches of mathematics. Prerequisite: MA 443. Credit, 3 hours.

**445 Theory of Numbers.** Prime numbers, unique factorization theorem, congruences, Diophantine equations, primitive roots, quadratic reciprocity theorem. Prerequisite: MA 342 or 442. Credit, 3 hours.

**446 Combinatorial Mathematics.** Topics to be chosen from the following: permutations and combinations, generating functions, graph theory, transport networks, matching theory, block designs, coding theory and Polya's counting theory. Prerequisite: MA 342 or approval of instructor. Credit, 3 hours.

**447 Introductory Algebraic Geometry.** Affine and projective space, algebraic varieties,

plane algebraic curves, simple and multiple points, intersection multiplicities, conics and cubics, rational curves, zeros and poles, the Riemann-Roch theorem. Prerequisite: MA 443. Credit, 3 hours.

**450 Advanced Multivariable Calculus.** Properties of continuous mappings from  $E_n$  to  $E_m$  and an introduction to differential forms and vector field theory based on line and surface integrals and the general Stokes' theorem. Prerequisites: MA 370 and either 342 or 442. Credit, 3 hours.

**460 Applied Real Analysis.** Vector approach to functions of several variables, curvilinear coordinates, Jacobians and the implicit function theorem, multiple integrals, change of variables, line and surface integrals; Green's, Stokes' and divergence theorems. Prerequisite: MA 212 or 260. Credit, 3 hours.

**461 Applied Complex Analysis.** Analytic functions, complex integration, Taylor and Laurent series, residue theorem, conformal mapping and harmonic functions. Prerequisite: MA 362 or 370 or 460, or approval of instructor. Credit, 3 hours.

**462 Partial Differential Equations.** Second order partial differential equations, emphasizing Laplace, wave and diffusion equations; solutions by the methods of characteristics, separation of variables and integral transforms. Prerequisite: MA 362 or 370 or 460, or approval of instructor. Credit, 3 hours.

**463 Transform Theory and Operational Methods.** Fourier, Laplace and other transforms; applications to boundary value problems; generalized functions and modern operational mathematics. Prerequisite: approval of instructor. Credit, 3 hours.

**464 Numerical Analysis I.** A first course in numerical analysis. Typical topics are numerical solution of algebraic and transcendental equations, linear problems, matrices, eigenvalues, finite differences, summation of series, interpolation, numerical differentiation and integration, numerical solution of ordinary differential equations, iterative methods. Pre-

requisites: knowledge of computer programming, MA 212 and 342, or approval of instructor. Credit, 3 hours.

**465 Numerical Analysis II.** Continuation of MA 464. Prerequisite: MA 464. Credit, 3 hours.

**470 Foundations of Analysis I.** Real and complex numbers, metric and Euclidean spaces, continuity, differentiation, Riemann-Stieltjes or Riemann integration. Prerequisites: MA 370 and either 342 or 442. Credit, 3 or 4 hours.

**471 Foundations of Analysis II.** Continuation of MA 470 with a variety of topics such as convergence theorems, Fourier series, normed linear spaces, Lebesgue integral. Prerequisite: MA 470. Credit, 3 hours.

**474, 475 Differential Equations.** Linear differential equations, regular singular points, existence and uniqueness theorems, systems, autonomous systems, Sturm-Liouville problems, simple partial differential equations. Prerequisite: MA 370. Credit, 3 hours each semester.

**480, 481 Mathematics in the Upper Elementary Grades.** Algebra, geometry, probability and statistics appropriate for the teacher in grades 6-9. Prerequisite: MA 381. Credit, 3 hours each semester.

**483 Mathematics in the Secondary School.** Selected topics in algebra and geometry. Prerequisite: approval of instructor. Credit, 3 hours.

**484 Mathematics in the Secondary School.** Selected topics in probability and statistics. Prerequisite: approval of instructor. Credit, 3 hours.

**485 History of Mathematics.** Topics from the history of the origin and development of mathematical ideas. Prerequisite: MA 370. Credit, 3 hours.

**510, 511 Point Set Topology.** Topological spaces, metric spaces, compactness, connectedness, local properties, product and decomposition spaces, mappings, covering properties, separation properties. Prerequisite:

MA 410 or 470, or approval of instructor. Credit, 3 hours each semester.

**513 Algebraic Topology.** Homotopy theory, simplicial and singular homology, cohomology. Prerequisites: MA 443 and 510, or approval of instructor. Credit, 3 hours.

**514, 515 Advanced Point Set Topology.** Continuation of MA 511. Prerequisite: MA 511 or approval of instructor. Credit, 3 hours each semester.

**519 Topics in Topology.** Prerequisite: approval of instructor. May be repeated for credit. Credit, 2-3 hours.

**520, 521 Stochastic Processes.** Stochastic models, stationary processes, Poisson processes, renewal processes, Markov chains, generalized harmonic analysis. Prerequisites: MA 342, 424 and 471, or approval of instructor. Credit, 3 hours each semester.

**522, 523 Theory of Statistics.** Probability, distribution theory, limiting distributions, multivariate analysis, correlation and regression, quadratic forms in normal variables, estimation, statistical hypotheses, analysis of variance and covariance, sequential analysis, nonparametric inference, decision theory. Prerequisites: MA 427 and a knowledge of the algebra of matrices, or approval of instructor. Credit, 3 hours each semester.

**526, 527 Advanced Probability.** Measure-theoretic foundations of probability, distribution functions and characteristic functions, law of large numbers and central limit theorems, conditional probabilities, martingales and topics in stochastic processes. Prerequisites: MA 571 and either 424 or 426, or approval of instructor. Credit, 3 hours each semester.

**530, 531 Metamathematics.** First order theories, incompleteness and undecidability, recursion theory, theory of models. Prerequisite: MA 430 or approval of instructor. Credit, 3 hours each semester.

**540, 541 Banach Spaces of Analytic Functions.** Fourier series analytic and harmonic functions

in the unit disc,  $H^p$  spaces, analytic functions with continuous boundary values, the Gelfand representation. Prerequisites: MA 570 and 572, or approval of instructor. Credit, 3 hours each semester.

**543, 544 Abstract Algebra.** Groups, modules, rings and fields; Galois theory, homological algebra, representation theory. Prerequisite: MA 444 or approval of instructor. Credit, 3 hours each semester.

**545 Advanced Topics in Number Theory.** Topics selected from classical, analytic, additive and algebraic number theory. Prerequisites: MA 445 and approval of instructor. May be repeated for credit. Credit, 1-3 hours.

**547, 548 Group Theory.** Groups with operators, composition series, solvable groups, abelian groups, Sylow's theorems, linear groups. Prerequisite: approval of instructor. Credit, 3 hours each semester.

**549 Advanced Topics in Algebra.** Topics selected from Galois theory, algebraic number theory and algebraic function theory. Prerequisites: MA 544 and approval of instructor. May be repeated for credit. Credit, 1-3 hours.

**550, 551 Methods of Mathematical Physics.** Topics selected from matrices, orthogonal functions, integral equations, calculus of variations, eigenvalue problems, perturbation methods, boundary value problems. Prerequisites: MA 342 and either 461 or 470 or approval of instructor. Credit, 3 hours each semester.

**552, 553 Tensor Analysis.** Vector spaces, algebra and calculus of tensors, differential forms; applications to geometry and various branches of applied mathematics including mechanics, relativity and the mechanics of continuous media. Prerequisites: MA 342 and either MA 450 or 460, or approval of instructor. Credit, 3 hours each semester.

**554 Calculus of Variations.** Necessary and sufficient conditions of Euler, Weierstrass, Legendre and Jacobi; direct methods and Dirichlet principle, Ritz and Galerkin methods

of approximate solutions, applications to eigenvalue problems and partial differential equations. Prerequisite: MA 470 or approval of instructor. Credit, 3 hours.

**559 Topics in Nonlinear Mathematics.** Prerequisites: MA 470 and approval of instructor. May be repeated for credit. Credit, 3 hours.

**564, 565 Advanced Numerical Analysis.** Topics such as finite difference equations, orthogonal polynomials, quadrature, approximation and iteration theory, numerical solution of differential equations. Prerequisite: MA 464 or approval of instructor. Credit, 3 hours each semester.

**569 Topics in Analysis.** Riemann surface theory, univalent or multivalent function theory, summability processes, analytic theory of continued fractions. Prerequisite: approval of instructor. May be repeated for credit. Credit, 3 hours.

**570, 571 Real Analysis.** Lebesgue integration, abstract measure theory,  $L_p$  spaces and linear functionals, differentiation. Prerequisite: MA 471 or approval of instructor. Credit, 3 hours each semester.

**572, 573 Complex Analysis.** Analytic functions, complex integration, Taylor and Laurent series, residue theorem, partial fractions and infinite product representation of functions; Riemann mapping theorem, analytic continuation, harmonic functions, Dirichlet problem; Green's function, conformal mapping. Prerequisite: MA 471 (and 461 desirable), or approval of instructor. Credit, 3 hours each semester.

**574, 575 Theory of Ordinary Differential Equations.** Systems, existence proofs, singularities, asymptotic behavior of solutions, boundedness of solutions, eigenvalues and eigenfunctions, perturbation theory. Prerequisites: MA 470 and 474, or approval of instructor. Credit, 3 hours each semester.

**576, 577 Theory of Partial Differential Equations.** Existence and uniqueness theorems, boundary value and initial value problems,

characteristics; Green's function, maximum principle, variational and operational methods, Sturm-Liouville theory. Prerequisite: knowledge of Lebesgue integration or approval of instructor. Credit, 3 hours each semester.

**578, 579 Functional Analysis.** Metric, Banach and Hilbert spaces. Bounded and unbounded transformations, spectral theory, and application to classical analysis. Prerequisite: MA 571 or approval of instructor. Credit, 3 hours each semester.

**582 Modern Mathematics for Teachers.** Theory of sets, real number system, transfinite numbers and other selected topics. Prerequisite: approval of instructor. Credit, 3 hours.

**583 Abstract Algebra for Teachers.** Postulational approach to algebra; elementary mathematical systems, including groups and fields. Prerequisite: approval of instructor. Credit, 3 hours.

**585 Modern Geometry for Teachers.** Euclidean, projective and non-Euclidian geometries. Prerequisite: approval of instructor. Credit, 3 hours.

**586 Probability and Statistics for Teachers.** Probability theory based on the theory of sets and the modern concepts of statistical inference; problems related to the teaching of statistics in high school. Prerequisite: approval of instructor. Credit, 3 hours.

**587, 588 Analysis for Teachers.** Subject matter in mathematics appropriate for accelerated programs in secondary schools, including analytic geometry and calculus. Prerequisite: approval of instructor. Meets daily. Credit, 3 hours each semester.

**591 Seminar.** Credit, 2-3 hours. Topics may be selected from the following:

- (a) Analysis
- (b) Applied Mathematics, Mathematical Physics
- (c) Probability
- (d) Topology
- (e) Algebra

- (f) Mathematical Statistics
- (g) Mathematical Logic
- (h) Numerical Analysis
- (i) Computer Science
- (j) Mathematics Education

Special Graduate Courses: 590, 594, 792, 799. (See pages 46-47.)

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## Military Science (Army ROTC)

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### Professor:

KNAPP (Main 214)

### Assistant Professors:

ARMSTRONG, BIGELOW, BUCHLY, CARDONA,  
GELINAS, McCACE, PELLEGRINO, RICKETSON,  
SAGRAMOSO, SORENSON, WALKER,  
WOLFGAM

**MS 101 Basic Military Science.** History of ROTC career opportunities; role of the Army in national security; nature and principles of war; study and development of leadership through practical exercises. One lecture/discussion, 1 hour leadership laboratory. Credit, 2 hours.

**102 Basic Military Science.** Military courtesy, discipline, customs and traditions of the service; organization and missions of small units; techniques of military instruction. One lecture/discussion, 1 hour leadership laboratory. Credit, 2 hours.

**101W, 102W Basic Military Science (Women).** United States Army's global role in national security; the historical use of military power; introduction to principles of military leadership and the military team. Credit, 2 hours each semester.

**201 Basic Military Science.** Operations of the basic military team; military geography; use of maps and aerial photographs; functions and

responsibilities of junior military leaders; practical experience in planning and control of small unit operation. Prerequisites: MS 101 and MS 102 or equivalent. Two lectures, 1 hour leadership laboratory. Credit, 2 hours.

**202 Basic Military Science.** Development of American military institutions, policies and traditions; relationship between military and other factions of American society; role of the military in the preservation and development of the nation. Prerequisites: MS 101 and MS 102 or equivalent. Two lectures, 1 hour leadership laboratory. Credit, 2 hours.

**301 Advanced Military Science.** Case studies in leadership and management; analysis of leader's role in directing and coordinating individuals and small units in offensive operations. Prerequisites: MS 201 and MS 202 or equivalent. Three lectures, 1 hour leadership laboratory. Credit, 3 hours.

**302 Advanced Military Science.** Analysis of the leader's role in directing and coordinating individuals and small units in defensive operations; airmobile concept, field communications, internal defense/development and the roles of the branches of the Army; comparison of U. S. and foreign military forces. Prerequisite: MS 301. Three lectures, 1 hour leadership laboratory. Credit, 3 hours.

**401 Advanced Military Science.** Theory and dynamics of the military team in combat operations; analysis of leadership and management problems. Prerequisites: MS 301 and MS 302. Three lectures, 1 hour leadership laboratory. Credit, 3 hours.

**402 Advanced Military Science.** Military justice; United States' position in the contemporary world scene and its impact on military leadership and management problems; code of conduct and management of personal affairs; practical application of leadership principles. Prerequisites: MS 301 and MS 302. Two lectures, 1 hour leadership laboratory. Credit, 2 hours.

**403 Flight Instruction.** Qualified students

receive 36½ hours of in-flight instruction and 35 hours of academic instruction leading to a private pilot's license. (The course is taken in conjunction with either MS 401 or MS 402.) Prerequisites: MS 301 and MS 302. No credit.

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## Philosophy

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### Professors:

ARNER (PS A-521), CARNEY, REIN'L

### Assistant Professors:

GIESCHEN, HOWELLS, HUMPHREY,  
VON BRETZEL, VOTICHENKO

### Departmental Major Requirements

#### Bachelor of Arts Degree Curriculum

**PHILOSOPHY** — Consists of 40 semester hours of credit of which at least 24 must be in philosophy and the remainder in approved courses within related fields.

### Departmental Graduate Programs

The Department of Philosophy offers programs leading to the degree of Master of Arts. Consult the *Graduate Catalog* for requirements.

**PI 101 Problems of Philosophy.** Questions of theory of knowledge, metaphysics, ethical and social values. Credit, 3 hours.

**103 Principles of Sound Reasoning.** Fallacies, traditional logic of the syllogism, elementary parts of symbolic logic, inductive logic and other related topics. Credit, 3 hours.

**311 Value Theory.** Investigation of problems in esthetics, personal ethics and philosophy of religion. Credit, 1-3 hours.

**312 Social Philosophy.** Topics relating to the evaluation of political, economic and social institutions. Credit, 1-3 hours.

**313 Metaphysics.** Inquiries concerning the ultimate nature of things, e.g., the mind-body problem, the existence of God, appearance and reality. Credit, 1-3 hours.

**314 Theory of Knowledge.** Problems such as the nature, limits and sources of human knowledge. Credit, 1-3 hours.

**315 Topics in the History of Philosophy.** Discussion of selected persons, movements and periods, both western and oriental. Credit, 1-3 hours.

**316 Logic.** Introduction to symbolic logic and selected topics of mathematical logic. Investigations of meaning, reference and truth. Credit, 1-3 hours.

**401 History of Ancient Philosophy.** History of western philosophy from its beginning through the Hellenistic period. Credit, 3 hours.

**402 History of Medieval and Renaissance Philosophy.** History of western philosophical thought from Augustine through the Renaissance. Credit, 3 hours.

**403 History of Modern Philosophy to Hume.** History of western philosophy from the Renaissance to Hume. Credit, 3 hours.

**404 History of Modern Philosophy from Kant to the Present.** Completion of the history survey. Credit, 3 hours.

**498 Pro-Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) Theory of Knowledge
- (b) Social and Moral Philosophy
- (c) Metaphysics and Logic
- (d) History of Philosophy

**591 Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) Theory of Knowledge
- (b) Social and Moral Philosophy

(c) Metaphysics and Logic

(d) History of Philosophy

**Special Graduate Courses:** 498, 500, 591, 592, 593. (See pages 46-47.)

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## Physics

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### Professors:

STONER (PS C-200), COWLEY, KEVANE,  
KYRALA, MEISTER, MUNCH, NIGAM, RAWLS,  
ROY, SNYDER, STROJNIK, WALKER, WORK

### Associate Professors:

AHMADZADEH, HANSON, HESTENES,  
JACOB, LU, YALE

### Assistant Professors:

BENIN, IMPSON, KAUFMANN, MARZKE,  
PAGE, VOSS

## Departmental Major Requirements

### Bachelor of Science Degree Curriculum

PHYSICS – Consists of 45 semester hours of credit. Required courses are PH 321, 322, 331, 332, 441, 461 and six semester hours of advanced laboratories, which must include PH 333. Additional courses in physics and upper division mathematics will be selected with the approval of the advisor. Each student must obtain credit in one year of French, German, Russian, or other foreign language approved by the advisor.

### Departmental Major Teaching Field Requirements

#### Bachelor of Arts in Education Degree Curriculum

GENERAL SCIENCE – Consists of 42 semester

hours of credit. Required courses are CH 113, 231; PH 111, 112; BO 100; ZO 100; GL 483; PA 321; PL 460 or 480. Electives must be approved by the general science major advisor.

GENERAL SCIENCE BROAD FIELD MAJOR – Consists of 60 semester hours of credit. Required courses are CH 113, 115, 231; PH 111, 112; PA 321, 322; BO 100; ZO 100; GL 100, 102; PL 460 or 480. Electives must be approved by general science major advisor.

PHYSICS – OPTION No. 1. Consists of 40 semester hours of credit. Required courses are PH 111, 112 (or 115, 116), 321, 331; PH 460 or 361; PH 463 (2 hours). An additional 9 hours in upper division physics (PH or PA) courses will be approved by the advisor in consultation with the student. Remaining courses to complete the major may be in physics and/or closely related fields, subject to the approval of the advisor.

OPTION No. 2. A student may elect this option in conjunction with either mathematics or chemistry majors. The physics portion of this program consists of 30 semester hours, with the following courses required: PH 111, 112 (or 115, 116), 321, 331; PH 460 or 361; PH 463 (2 hours). The remaining courses to complete the 30 hours may be in physics and/or closely related fields, subject to the approval of the physics advisor.

### Departmental Minor Teaching Field Requirements

PHYSICS – Consists of 24 semester hours of credit. Required courses are PH 111, 112, (or 115, 116), PH 460 or 361; one hour of PH 463. Remaining hours to complete the minor are selected from physics and/or upper

division physical science (PA) courses with the approval of the physics advisor.

GENERAL SCIENCE – Consists of 24 semester hours of credit. Required courses are MA 117; CH 101 or 113; PH 101 (or 111, 112); PA 121 or 321; BO 100; ZO 100; GL 111 or 483. Remaining hours are selected with the approval of the minor field advisor.

PHYSICAL SCIENCE – Consists of 24 semester hours of credit. Required courses are MA 117; CH 101 or 113; PH 101 (or 111, 112); PA 121 (or 321, 322); GL 111 or 483. Electives must be approved by the physical science minor advisor.

## Departmental Graduate Programs

The Department of Physics offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements. The Department has administrative responsibility for the interdepartmental program leading to the degree of Master of Natural Sciences.

## Science Education

Formally attached to the Physics Department, the science education faculty has primary responsibility for activities related to the teaching of science at the elementary and secondary school level, particularly those which cut across the boundaries of the individual sciences. Members of this group, with the cooperation of faculty members of the various science departments, in addition to offering formal courses and supervising general science requirements in the various degree programs for teachers, maintain a science education materials center. Other facilities include a planetarium used both for formal instruction and as a resource for schools in the area.

## PHYSICS

**PH 101 Introduction to Physics.** Survey of physics, emphasizing applications to life in the modern world. Understanding of elementary algebra is presumed. Three lectures, 1 recitation, 2 hours laboratory. Credit, 4 hours.

**111 General Physics.** Noncalculus treatment of the principles of mechanics, heat and sound. Prerequisite: MA 118 or equivalent. Three lectures, 1 recitation, 2 hours laboratory. Credit, 4 hours.

**112 General Physics.** Noncalculus treatment of the principles of electricity, magnetism and light, and a brief introduction to modern physics. Prerequisite: PH 111. Three lectures, 1 recitation, 2 hours laboratory. Credit, 4 hours.

**115, 116 University Physics.** Introduction to the principles of physics. Prerequisite: Concurrent enrollment in MA 120, 121, respectively. Four lectures, 1 recitation. Credit, 4 hours each semester.

**117, 118 Physics Laboratory.** Introductory experiments, measurements and techniques in physics. 2 hours laboratory. Credit, 1 hour each semester.

**251 Sound and Optics.** Vibrations and wave phenomena, with applications to acoustics and optics. Wave propagation, reflection, refraction, interference and diffraction. Prerequisites: MA 212; ES 201 and 231 or equivalent. Credit, 2 hours.

**320 Musical Acoustics.** Simple vibrating systems, analysis of a musical tone into components, loudness and pitch characteristics of the ear, tone production mechanisms of stringed, reed and brass instruments, correlation between the rules of harmony and the laws of acoustics. Prerequisite: Two years of music theory advisable. Credit, 4 hours.

**321 Analytical Mechanics.** Vector treatment of statics, kinematics and dynamics of particles; rigid bodies; forced, damped and coupled oscillators; central force motion. Prerequisites:

PH 115; MA 121 or approval of instructor. Credit, 4 hours.

**322 Analytical Mechanics.** Dynamics of systems of particles; constraints; accelerated reference systems; rigid body motion; Lagrangian mechanics; continuum mechanics. Prerequisites: PH 321; MA 212. Credit, 4 hours.

**331 Electricity and Magnetism.** Electric fields, potentials, Gauss' law, electrostatics of conductors and dielectric materials, DC and AC circuits; Ampere's and Faraday's laws. Prerequisite: PH 116, MA 212 or approval of instructor. Credit, 4 hours.

**332 Electromagnetic Fields.** Solutions of Laplace's equation, magnetic materials, equation of continuity, scalar and vector potentials, Maxwell's equations, electromagnetic waves. Prerequisites: PH 321, 331; MA 212. Credit, 4 hours.

**333 Electricity and Magnetism Physical Measurements.** Experimental techniques and theory of electric and magnetic measurements. Extra-laboratory practice in the planning of experiments, organization and presentation of results. Prerequisites: PH 117, 118, enrollment in PH 331. Three hours laboratory. Credit, 2 hours.

**334 Electricity and Magnetism Physical Measurements.** Selected advanced experiments in electric and magnetic measurements. Prerequisite: PH 333. Three hours laboratory. Credit, 2 hours.

**361 Modern Physics.** Special relativity and introductory quantum theory with applications drawn from atomic, nuclear and solid state physics. Prerequisites: ES 231 and 312, MA 212 or equivalent. Credit, 3 hours.

**401, 402 Mathematical Methods in Physics.** Elements of vector calculus, complex variables, ordinary and partial differential equations, integral transforms, special functions, determinants, matrices, probability and statistics, as applied to physical problems. Prerequisites: MA 212, PH 321. Credit, 3 hours each semester.

**415, 416 Physics for In-Service Teachers.** Concepts and principles of physics. Prerequisite: approval of instructor. Credit, 3 hours each semester.

**434 Circuit Theory and Electronics.** Network theory, characteristics of nonlinear elements, vacuum tubes and transistors. Basic circuits and their applications in physical measurements. Prerequisite: PH 331. Three lectures, 3 hours laboratory. Credit, 4 hours.

**441 Statistical and Thermal Physics I.** Statistical and experimental basis of heat, temperature and entropy. Mechanical and statistical basis of the laws of thermodynamics. Applications of macroscopic thermodynamics. Phase equilibrium. Prerequisites: PH 321, 331. Credit, 3 hours.

**442 Statistical and Thermal Physics II.** Principles and applications of statistical mechanics. Quantum statistics of ideal gases and simple solids. Equilibrium of phases and chemical species. Transport theory. Irreversible processes and fluctuations. Prerequisite: PH 441. Credit, 3 hours.

**450 Elements of Optics.** Principles and applications of geometrical and physical optics. Designed for teachers and students not majoring in physics. Prerequisites: PH 112 or 116; MA 212 or approval of instructor. Credit, 3 hours.

**451 Optics.** Physical and geometrical optics based on the Maxwell equations, including reflection, refraction, interference, simple diffraction theory and metal optics. Prerequisites: PH 332; MA 212. Credit, 3 hours.

**452 Advanced Optics.** Geometrical theory of optical imaging, rigorous diffraction theory, interference and diffraction with partially coherent light, fiber optics, crystal optics, masers and lasers. Prerequisite: PH 451. Credit, 3 hours.

**453 Optics Physical Measurements.** Experimental techniques and theory of optical measurements. Extra-laboratory practice in the planning of experiments, organization and

presentation of results. Prerequisite: Enrollment in PH 451. Three hours laboratory. Credit, 2 hours.

**460 Elements of Atomic Physics.** Survey of electron and atomic physics. Designed for teachers and students not majoring in physics. Prerequisite: One year of college physics. Credit, 3 hours.

**461 Modern Physics.** Special relativity, origin of quantum theory, the nuclear atom, elementary particles, introductory quantum mechanics, atomic and molecular spectra. Prerequisites: PH 321, 331; MA 212. Credit, 4 hours.

**462 Nuclear Physics.** Static properties of nuclei, natural and induced radioactivity, nuclear reactions, nuclear models and energy levels, mesons and hyperons, interaction of photons and electrons with matter. Prerequisite: PH 461. Credit, 3 hours.

**463 Physical Measurements.** Selected experiments in mechanics and heat, electricity and magnetism, optics and modern physics. Designed for teachers and students not majoring in physics. Prerequisite: PH 112. Three hours laboratory. May be repeated for a maximum of 3 hours credit. Credit, 1 hour.

**464 Elements of Nuclear Physics.** Survey of nuclear physics. Designed for teachers and students not majoring in physics. Prerequisite: PH 460 or equivalent. Credit, 3 hours.

**465 Modern Physics Laboratory.** Experimental techniques and theory of modern physical measurements. Extra-laboratory practice in the planning of experiments, organization and presentation of results. Prerequisite: PH 333 and enrollment in PH 461. Three hours laboratory. Credit, 2 hours.

**466 Advanced Experimental Physics.** Techniques and concepts of experimental physics through selected experiments chosen to meet the needs of the individual student. Prerequisites: PH 333 and approval of the instructor. Credit, 1-3 hours. May be repeated for credit.

**471 Quantum Mechanics.** Wave mechanics, Schrödinger's equation, barrier problems, operators and eigenfunctions, harmonic oscillator, one-electron atoms and other topics. Prerequisites: PH 322, 461, or approval of instructor. Credit, 3 hours.

**472 Quantum Mechanics.** Matrix mechanics, angular momentum, perturbation theory, scattering theory and other topics. Prerequisite: PH 461 or approval of instructor. Credit, 3 hours.

**480 Methods of Teaching Physics.** Evaluation of various approaches to the teaching of high school physics. Preparation of demonstrations and experiments. Organization of a laboratory. Designed for secondary school physics teachers. Prerequisite: approval of instructor. Credit, 3 hours.

**481 Solid State Physics.** Structure, elastic properties and dynamics of crystals; electron motions in crystals under applied fields; selected topics. Prerequisite: PH 471. Credit, 3 hours.

**482 Physics of Semiconducting Materials.** Brillouin zones and electron energy bands; impurity states, electron statistics and electrical conduction; carrier mobility and Hall effect; nonequilibrium effects, recombination. Prerequisite: PH 471. Credit, 3 hours.

**495 Project Research.** Individually supervised project in experimental physics. Prerequisite: 4 hours selected from PH 333, 334, 453 and 465. Credit, 1-3 hours. Note: approval of faculty member under whose direction the work is to be done must be obtained before registration.

**501 Methods of Theoretical Physics.** Physical applications of functions of a complex variable, algebraic eigenvalue problems, vector/function analogies in Hilbert space, boundary and initial value problems of scalar and vector fields in partial differential and integral form, Green's functions and topics selected from operator algebra, tensor and spinor calculus and quaternions. Prerequisite: approval of instructor. Credit, 3 hours.

**502 Methods of Theoretical Physics.** Variational principles, applications of Laplace and Fourier transforms, dispersion relations, Markov chains, wave propagation, diffusion, potential theory and topics selected from Lorentz invariants, theory of second quantization and group representations. Prerequisite: approval of instructor. Credit, 3 hours.

**503 Physical Applications of Group Theory.** Fundamentals and applications of the theory of finite and continuous groups as they occur in physics. Applications will be drawn from atomic, molecular, solid state and elementary particle physics. Prerequisite: approval of instructor. Credit, 3 hours.

**521, 522 Classical Mechanics.** Variational principles, Lagrange's and Hamilton's equations; rigid body motion; canonical transformation. Hamilton-Jacobi theory; continuum mechanics; elements of hydrodynamics, elasticity theory and special relativity; selected topics. Prerequisite: PH 322. Credit, 3 hours each semester.

**523 Relativity.** Special and general theories of relativity. Prerequisites: PH 522, 532 or approval of instructor. Credit, 3 hours.

**531, 532 Electromagnetic Theory.** Boundary value problems; principle of relativity, relativistic particle kinematics; Lorentz invariant formulation of electrodynamics; comparison of microscopic and macroscopic formulations of Maxwell's equations; motion and radiation of point charges; propagation, polarization, diffraction and scattering of light; problem of a point particle with a magnetic moment; self-energy problem. Prerequisite: PH 332. Credit, 3 hours each semester.

**541 Statistical Physics.** Probability theory and principles of statistical inference. Application to problems of evaluating experimental data and to foundations of statistical mechanics. Derivation of the general laws of thermodynamics from microscopic theories. Calculation of specific properties of bulk matter. Prerequisites: PH 441, 471; 442 (desirable). Credit, 3 hours.

**542 Advanced Topics in Statistical and Thermal Physics.** Topics chosen from: theory of irreversible processes, Onsager-reciprocity laws; fluctuation-dissipation theorem; relaxation and transport processes in fluids and plasmas; Liouville equation; the BBGKY hierarchy of distribution functions; kinetic theory; derivation of the laws of hydrodynamics from many-body theory; phase changes and phase equilibrium; Ferromagnetism. Prerequisite: PH 541. Credit, 3 hours.

**543 Plasma Physics.** Fundamental physical phenomena in the plasma state; equilibrium and stationarity, oscillations and wave propagation, conduction, diffusion and radiative phenomena. Prerequisite: approval of instructor. Credit, 3 hours.

**551 X-Ray and Electron Diffraction.** Fresnel and Fraunhofer diffraction in integral formulation. Diffraction of X-rays and neutrons by crystal lattices and applications to the study of the structures of solids, including crystal structure analysis. Theory and techniques of electron microscopy and electron diffraction for the study of crystalline and noncrystalline specimens. Outline of new techniques and recent advances in the diffraction study and imaging of the structures and defects of solids. Prerequisites: PH 451, 481 or equivalent. Credit, 3 hours.

**561, 562 Nuclear Physics.** Two nucleon interaction, Clebsch-Gordon coefficients, internucleon forces, meson theory and high energy scattering, nuclear binding energy, nuclear models, transition probability estimates, nuclear reactions, beta decay. Prerequisites: PH 462, 576 or approval of instructor. Credit, 3 hours each semester.

**563 Atomic Spectra and Structure.** Atomic spectra from the viewpoint of quantum mechanics, including selection rules, intensities, the Stark and Zeeman effects, and hyperfine structure. Prerequisite: PH 576. Credit, 3 hours.

**564 Molecular Spectra and Structure.** Molecular spectra from the viewpoint of quantum mechanics including the analysis of electronic,

vibrational and rotational spectra of polyatomic molecules and the use of group theory to simplify the calculations. Prerequisite: PH 471. Credit, 3 hours.

**568 High Energy Particle Physics.** Classification of particles, cross sections, decay rates, isotopic spin formalism and higher symmetries, phenomenology of strong, electromagnetic and weak interactions. Prerequisite: PH 577. Credit, 3 hours.

**576, 577 Quantum Theory.** Abstract approach to quantum mechanics in Hilbert space; observables and their corresponding operators, eigenstates and eigenvalues; quantum dynamics; approximation methods; systems of identical particles; angular momentum and group representation theory; collision processes; relativistic quantum theory. Prerequisites: PH 471, 522. Credit, 3 hours each semester.

**578, 579 Relativistic Quantum Theory.** Relativistic one-particle equations, Klein-Gordon equation, Dirac equation, second quantization, theory of scattering, S-matrix, Feynman diagrams, quantum electrodynamics, renormalization procedures. Prerequisites: PH 577. Credit, 3 hours each semester.

**581 Solid State Physics.** Quantum theory of solids including phonons, lattice specific heats, band structure models, Fermi surfaces, thermal expansion, plasmons, electron-phonon interactions and scattering by lattice defects. Prerequisites: PH 481 or 482; 472; concurrent enrollment in PH 576. Credit, 3 hours.

**582 Solid State Physics.** Elements of transport theory, thermal conduction, electronic conduction in metals, mobility in semiconductors, Hall effect, magnetoresistance and selected topics of current research. Prerequisite: PH 581. Credit, 3 hours.

**Special Graduate Courses:** See pages 46-47.

## GENERAL SCIENCE AND ASTRONOMY

**PA 110 Physical Universe.** The universe as a unit; stars, solar system, earth, and atoms. Nature of matter and energy. Three lectures, 2 hours laboratory. Credit, 4 hours.

**121 Descriptive Astronomy.** Basic description of features, relationships and origin of solar systems, stars and galaxies in the universe. Observatory and planetarium experiences. Credit, 2 hours.

**122 Space Science.** Developments in exploration of space and their implications for man, including topics from physical and biological sciences of importance to understanding of solar system environments. Prerequisite: PA 121. Credit, 2 hours.

**321 General Astronomy.** Astronomical instruments, coordinate systems, planets, origin and development of the solar system, emphasizing understanding through the application of physical principles developed in the course. Observatory and planetarium experiences. Prerequisite: PH 101 or equivalent. Credit, 3 hours.

**322 General Astronomy.** Stars and star systems, stellar evolution, galaxies and cosmological theories, topics from current developments in astronomy and astrophysics. Observatory and planetarium experiences. Prerequisite: PA 321 or approval of instructor. Credit, 3 hours.

**361, 362 Science and Man.** Effects upon man of his technological civilization and consideration of recent advances in both pure and applied physical sciences. PA 361 includes topics from mechanics, electromagnetic radiations and astronomy. PA 362 includes topics from geology, chemistry and nuclear energy. Courses may be taken in either order. Credit, 2 hours each semester.

**410 Origins of the Physical Sciences.** Origins of astronomy, chemistry, physics and mathematics in the cultures of Mesopotamia, Egypt, China and India. Credit, 3 hours.

**411 Development of the Physical Sciences.**

Hellenistic mathematics, physics, chemistry and astronomy. Arabs and the physical sciences; their role in spreading the physical sciences to Europe. The development of the physical sciences in Europe until the time of Newton. Credit, 3 hours.

**412 Concepts and Social Impact of Modern Physics.**

For nonphysics majors. Important advances of physics during the 20th century, e.g. relativity, quantum theory, nuclear energy, etc., and philosophical, social and technological issues raised by these developments. No physics or mathematics prerequisites. Credit, 3 hours.

**421 Astrophysics.** Selected topics from astronomy and astrophysics. Prerequisites: PH 321. 331. Credit, 3 hours.

**Special Graduate Courses:** See pages 46-47.

## SCIENCE EDUCATION

**PL 320 Science for the Elementary School.**

Selected basic generalizations in the physical and biological sciences suitable for use in grades 1-8. Activities include laboratory and a three-day science field study. Prerequisite: PA 110; BI 100; or 4 hours each of physical and biological science. Four hours a week. Credit, 3 hours.

**460 Science in the Junior High School.** Important science areas suitable for the junior high school. Recent developments in modern junior high school science curricula, laboratory techniques and the processes of science are stressed. Prerequisite: PL 320 or equivalent. Two lectures, 2 hours laboratory. Credit, 3 hours.

**480 Methods of Teaching Physical Science.**

Methods of instruction, organization and presentation of appropriate topics in physical science. Prerequisites: SE 311, 15 hours of physical science or approval of instructor. Credit, 3 hours.

**Special Graduate Courses:** See pages 46-47.

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## Political Science

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**Professors:**

WHITE (SS 416), ALISKY, GABLE, HINK,  
MASON, PEEK, RICE, SWAGERT, UHL,  
VICKERS, ZOLL

**Associate Professors:**

JO, KAMINSKY, READER, WOLF

**Assistant Professors:**

BERMAN, DALGLEISH, EILERS, KOSLOW,  
McGAW, RUHALA, VICHULES, WALKER,  
WATSON

**Lecturer:**

DEBOLSKE

**Departmental Major Requirements****Bachelor of Arts Degree Curriculum**

**POLITICAL SCIENCE** – Consists of 45 semester hours of credit of which 30 must be in political science and 15 in closely related fields to be approved by the advisor in consultation with the student. Courses PS 100, 200, 250 or 260, one course in political theory (440, 441, 442, 443, 444 or 445) and 498 are required. The remaining 14 hours in political science must be selected from courses in the 400 series. At least 18 hours must be in upper division courses. Courses 310, 311, 312, 330 and 360 may not be counted toward a major in political science.

Students who major in political science must have a 2.0 average for all courses which count toward the major. Upper division courses which count toward the major must have “C” grades or better; one “D” grade in the lower division courses may be counted provided it is offset with at least one “B” in political science.

**LATIN AMERICAN STUDIES EMPHASIS**—Consists of the Bachelor of Arts degree requirements in political science. Thirty semester hours of the total degree program must consist of Latin American content courses selected with the approval of the advisor. A reading knowledge of Spanish is required. A reading knowledge of Portuguese is suggested. Fulfillment of these requirements will be recognized at graduation.

**ASIAN STUDIES EMPHASIS** – Consists of the Bachelor of Arts degree requirements in political science plus a minimum of two years of Chinese or Japanese. Thirty semester hours of the total degree program must consist of Asian courses selected with the approval of the advisor.

**Bachelor of Science Degree Curriculum**

**POLITICAL SCIENCE** – Consists of 51 semester hours of credit of which 36 must be in political science and 15 in closely related fields to be approved by the advisor in consultation with the student. The 36 hours include PS 100, 200, 250 or 260, one course in political theory (440, 441, 442, 443, 444 or 445), 401 and one course chosen from 402, 403, 431, 432, 436 or 437, and 498. Courses PS 310, 311, 312, 330 and 360 may not be counted toward a major in political science.

Students who major in political science must have a 2.0 average for all courses which count toward the major. Upper division courses which count toward the major must have “C” grades or better; one “D” grade in the lower division courses may be counted provided it is offset with at least one “B” in political science.

### Bachelor of Arts in Education Degree Curriculum: Departmental Teaching Major

**POLITICAL SCIENCE** – Consists of 42 semester hours of credit. Courses PS 100, 200, 411 and one course in political theory (440, 441, 442, 443, 444 or 445). An additional 26 hours, 12 of which must be in political science and 14 in closely related fields, will be approved by the advisor in consultation with the student. In addition, PS 480 is required as part of the professional education curriculum. Courses PS 310, 311, 312 and all other courses in the PS 300 series may not be counted toward a major in political science.

Students who major in political science must have a 2.0 average for all courses which count toward the major. Upper division courses which count toward the major must have “C” grades or better; one “D” grade in the lower division courses may be counted provided it is offset with at least one “B” in political science.

### Departmental Teaching Minor

**POLITICAL SCIENCE**—Consists of 24 semester hours of credit. Courses PS 100, 411 and one course in political theory (440, 441, 442, 443, 444 or 445), and two of the following (200, 250, 260) are required. Courses PS 310, 311 and 312 may not be counted toward a teaching minor in political science.

Students who minor in political science must have a 2.0 average for all courses which count toward the minor. Upper division courses which count toward the minor must have “C” grades or better; one “D” grade in the lower division courses may be counted on the recommendation of the undergraduate advisor.

### Departmental Graduate Programs

The Department of Political Science offers programs leading to the degrees Master of Arts, Master of Public Administration and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

### Institute of Public Administration

The Institute of Public Administration is a research and service agency of the University closely related to the Department of Political Science. The activities of the Institute are concentrated primarily in research and publication and public service in relation to governmental activities in the State of Arizona.

**PUBLIC SAFETY ADMINISTRATION EMPHASIS**—A public safety administration program for law enforcement and fire personnel with a major in political science is available at the undergraduate level. Regular departmental, college and university course requirements must be met. The Institute of Public Administration of the Department of Political Science will coordinate this program.

The requirement for a degree in political science should include 24 hours for the B.A. or 30 hours for the B. S. degree, to be chosen from the following list: PS 100, 200, 410, 411, 413, 420, 423, 431 or 433, 470, 471, 474, 498 and one course in political theory and one in international relations for a total of 30 hours or 36 hours respectively.

Related courses to meet political science or liberal arts requirements should include at least 6 hours in psychology (PX 100, 270 or 315), 9 hours in sociology (SO 101, 332, 340, 341, 440, 446 or 447), and 3 hours from anthropology (AN 311 or 351). Transcripts upon graduation, on the request of the student, may include the subtitle: Political Science – Public Safety Administration Emphasis.

**PS 100 Government and Politics.** Major philosophies and institutions of modern government. Illustrative material derived primarily from American government. Meets the federal government requirement for teacher certification. Two lectures, 2 discussions. Credit, 4 hours.

**200 Problems of American Government.** Powers, functions and agents of American political institutions. Meets the federal government requirement for teacher certification. Prerequisite: PS 100. Credit, 3 hours.

**250 Comparative Government.** Comparative study of political systems, emphasizing Britain, France, Germany and Russia. Prerequisite: PS 100. Credit, 3 hours.

**260 International Relations.** Contemporary international affairs through survey of the major problems in each of the important geographic regions. Prerequisite: PS 100. Credit, 3 hours.

**310 Federal Constitution and Government.** Constitution and government of the United States at the national level. Not open to students having credit for PS 100 or any course in the U. S. national government. Meets the federal government requirement for teacher certification. May not be counted for the major, the teaching major or the teaching minor in political science. Credit, 2 hours.

**311 Arizona Constitution and Government.** Constitution and government of the State of Arizona. Not open to students having credit for a course in state government. Meets the Arizona government requirement for teacher certification. May not be counted for the major, the teaching major or the teaching minor in political science. Credit, 1 hour.

**312 National and Arizona Government.** Constitutions and governments of the United States and Arizona. Not open to students having credit for PS 100 or any course in U.S. national and Arizona governments. Meets the federal and Arizona government requirements for teacher certification. May not be counted for the major, the teaching major, or the teach-

ing minor in political science. Credit, 3 hours.

**330 Current Issues in National Politics.** Major current issues facing the national government in the domestic field. May not be counted for the major or the teaching major in political science. Credit, 3 hours.

**360 Current Issues in International Politics.** Principal current issues involving the nation-state system in the world today. Attention to America's role in the international arena. May not be counted for the major or the teaching major in political science. Credit, 3 hours.

**401 Introduction to Political Statistics.** Derivation and interpretation of measures of central tendency, variability and correlation, and their application to political data, emphasizing logical basis of statistical inference. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**402 Political Statistics.** Nonparametric statistics, multiple and partial correlation, factor analysis and analysis of variance. Prerequisite: PS 401 or approval of instructor. Credit, 3 hours.

**403 Survey Research.** Sample design, questionnaire construction, interviewing, data processing and analysis. Prerequisite: PS 401. Credit, 3 hours.

**410 Municipal Government and Politics.** Politics and administration of city and town government in the United States. Problems, forms and services of city government. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**411 State Government.** Major problems of state government, including constitutional revision, governmental reorganization, legislative apportionment and other matters. Special attention to Arizona government. Meets the Arizona requirement for teacher certification. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**412 Metropolitan Government and Politics.** Political process in the metropolis with an examination of government organizations and

decision-making structures. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**413 The Legislative Process.** Lawmaking process followed in selected legislative bodies; composition of membership, organization, powers; impact of internal and external forces on legislation. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**414 The American Presidency.** Office, role and power of the American Presidency in the American political system. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**417 Information Systems in the Public Policy Process.** Introduction to systems analysis concepts and theory as applied to administration and the decision-making process. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**419 Governmental Program Administration.** Programming national governmental services: formulation, financing, management and inter-agency relationships. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**420 Introduction to Public Administration.** Role of the administrator in the political process with an examination of the basic concepts of bureaucracy. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**421 Organizational Theory.** Organizational theories and current research emphasis with an examination of their application to public administrative organizations. Prerequisite: six hours in political science or approval of the instructor. Credit, 3 hours.

**422 Governmental Budgeting and Finance Administration.** Legal, social and political nature of governmental budgets and the budgetary process. Budget-making procedures are analyzed with an evaluation of administrative techniques of budget control. Prerequisite: six hours in political science or approval

of the instructor. Credit, 3 hours.

**423 Public Personnel Administration.** History of civil service. Problems of recruitment, examination, preparation, pay scales, promotion, employee motivation and discipline. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**424 Administrative Regulation and Politics.** Regulatory procedures, practices and concepts: political, economic, legal and judicial controls over administrative rule-making. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**425 Public Administration and Policy Development.** Relationships between policy development and administrative processes as affected by the various role of legislative bodies, executive and administrative agencies. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**426 Municipal Administration.** Municipal administrative processes and practices in urban governments in the United States. Organizational structure and administrative practices, with an examination of leadership, influence groups and legislative-administrative relations. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**427 Urban Planning Administration.** Emphasizes administrative techniques in urban planning administration within the urban decision-making structure. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**428 Comparative Administration.** Analysis of theories, techniques and procedures utilized in the study of administrative organizations of nations and governmental units at various stages of development. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**429 Politics of the Urban Planning Process.** Analysis of political processes involved in planning programs in the urban environment.

Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**430 Political Parties.** Development of the American party system. Party organization and functions. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**431 Public Opinion and Propaganda.** Formation, expression and influence of individual and organized opinion on political institutions. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**432 Introduction to Political Behavior.** Designed to examine political activities of men in the community and in governmental institutions using behavioral techniques. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**433 Pressure Groups.** Aims, techniques and influence of interest groups in American politics. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**434 Comparative Politics.** Political parties, pressure groups, elections, legislators and executives studied from a cross-national perspective. Effect on politics of differences in political culture, political style and socio-economic attributes. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**435 Modernization and Political Change.** Political and social problems associated with modernization. Empirical focus on one or more developing regions. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**436 Electoral Behavior.** Voting behavior and the attitudes, perceptions and activities of the citizenry in the political process. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**437 Political Socialization.** Examines the learning process by which persons of various cultures acquire the knowledge, skills and attitudes that make them able members of

their political systems. Recent theories and techniques of inquiry. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**438 Revolution and the Social System.** Analytical and empirical study of the causes and consequences of revolution. Identification of systemic structures and institutions conducive to radical and moderate patterns of conflict resolution. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**439 Minority Group Politics in America.** Role of minority groups in American politics. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**440 History of Political Philosophy I.** Western political philosophers and their theories to the 17th century. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**441 History of Political Philosophy II.** Western political philosophers and their theories from the 17th century to the 20th century. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**442 American Political Thought.** Political theories and movements from the colonial period to the present. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**443 The Analytical Revolution in Contemporary Political Thought.** Examines the thought of representative anthropological, economic, political, psychological and sociological contributors (e.g., Malinowski, Keynes, Dahl, Freud, Weber, Parsons) to the study of politics. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**444 The Normative Revival in Contemporary Political Thought.** An account of the thought of some leading contemporary political philosophers (e.g., Camus, Sartre, Strauss, Marcuse, Oakeshott). Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**445 Eastern Political Thought.** Contemporary political ideas and theories in East and Southeast Asia including the impact of Western thought, especially Communist, on revolutionary process. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**450 Government and Politics of the Soviet Union.** Description and comparative analysis of Soviet government and institutions. Appraisal of the Soviet economic system and incentives, and of the machinery for control of the people. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**451 Governments and Politics of Eastern Europe.** Governments and politics of Eastern European nations. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**452 Governments and Politics of Communist Asia.** Background of the Communist revolution, political processes and developmental problems in mainland China and other Communist states. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**453 Governments and Politics of South America.** Governmental institutions, political processes and developmental problems of the South American states. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**454 Government and Politics of Mexico.** Mexican federal, state and local governmental institutions. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**455 Governments and Politics of Central America and the Caribbean.** Governmental institutions, political processes and developmental problems of the nation states and dependent areas of Central America and the Caribbean. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**456 Governments and Politics of Western Europe.** Structures and behavior of governmental institutions and political processes in selected countries of Western Europe. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**457 Governments and Politics of Central Europe.** Structure and behavior of governmental institutions and political processes in Central Europe, emphasizing the East German, Swiss, West German and Austrian systems in comparative perspective. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**458 Governments and Politics of Non-Communist Asia.** Political background. Governmental institutions, political dynamics and developmental problems of selected non-Communist nations in Asia. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**459 Governments and Politics of Africa.** Governmental institutions and processes of polities south of the Sahara. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**460 World Politics.** A theoretical examination of several aspects of international politics: the formulation of foreign policy, negotiations, alliances, arms races, crisis bargaining, wars and the development of international law and organization. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**461 American Foreign Policy.** United States in world affairs. American foreign policy since World War I. Techniques in formulating American foreign policies. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**462 International Relations of the Communist World.** Nature and objectives of foreign policy of the Communist camp, emphasizing Soviet foreign policy and the Sino-Soviet conflict. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**463 Inter-American Relations.** Diplomatic relations among the Latin American states. Development of U. S. foreign policy toward Latin America. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**465 International and Regional Organizations.** Theory, development and practices of international and supranational organizations. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**467 National Defense Policy.** Problems and issues of the organization and control of effective defense establishments within the context of various political systems. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**468 International Relations of Asia.** Relations among the Asian nations as well as their interactions with the great powers. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**470 Law and Society.** Nature, purposes and sanctions of law; sources of law; private law and public law, common law and civil law. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**471 Constitutional Law I.** Development of the United States Constitution as reflected in decisions of the Supreme Court: Jurisdiction and organization of the federal courts; judicial review; separation of powers; federalism; the commerce clause; national taxing and spending power; state police power. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**472 Constitutional Law II.** Development of the United States Constitution as reflected in decisions of the Supreme Court: Due process; equal protection of laws; individual rights; civil liberties. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**473 Judicial Decision-Making.** Relationship of political culture, institutional roles and per-

sonal attributes and attitudes to judicial decision-making. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**474 International Law.** Law of the nations as developed by custom and agreement and as exhibited in decisions of international and national tribunals. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**480 Methods of Teaching Government.** Methods of instruction, organization, and presentation of subject matter in political science. Prerequisite: SE 311 or concurrently, and 15 hours in political science or approval of instructor. Credit, 3 hours.

**490 The Political Novel.** Analysis of the role of the political novel in contemporary politics. Prerequisite: six hours in political science or approval of instructor. Credit, 3 hours.

**498 Pro-Seminar.** Small group study and research for advanced students within their major area. Prerequisite: major in the department or approval of instructor. Credit, 3 hours.

**501 Empirical Theory.** Empirical orientations to the study of politics, such as systems, structural-functional, decision-making, communications and game theories. Prerequisite: approval of instructor. Credit, 3 hours.

**502 Political Philosophy.** Selected traditional and contemporary topics in political philosophy. Prerequisite: approval of instructor. Credit, 3 hours.

**503 Quantitative Research Methods.** Research techniques, including elements of research design, measuring, sampling, data analysis and statistical inference, emphasizing computer applications. Prerequisite: PS 495. Credit, 3 hours.

**526 Internship in Government.** Required of all Master of Public Administration candidates without previous experience in government service. An internship to be served in an agency of federal, state or local government. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) American Government
- (b) Politics
- (c) Public Law
- (d) Comparative Government
- (e) International Relations
- (f) Public Administration
- (g) Political Theory

**Special Courses:** See pages 46-47 for Independent Study, Honors and Special Graduate Courses available to all university students.

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## Psychology

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**Professors:**

JONES (SS 321); HAYGOOD, MEYERSON,

**Associate Professors:**

BARDRICK, GALBRAITH, GERSTEN, LEVINE,  
MILLER, REICH, RIMM, SUTTON

**Assistant Professors:**

ARONSON, BRAVER, CHARTIER, DILLOW,  
KENNEDY, KILLEEN, LESHOWITZ, ROSSI,  
SAMSON, SANDLER, TAYLOR

**Visiting Assistant Professor:**

FLEMING

**Visiting Associate Professors:**

LEVY, PILTZ

**Lecturer:**

HAYCOX

### Departmental Major Requirements

#### Bachelor of Arts Degree Curriculum

PSYCHOLOGY—Consists of 45 semester hours, of which 27 must be in psychology and 18 in related courses to be approved by the advisor in consultation with the student.

Required courses in psychology are 100, 230, 290; one course from among 315, 341 or 350; one course from among 323, 324 or 325; and at least two courses from the 400-level offerings. Required related courses are MA 141 and 142, or their equivalents, which students are encouraged to complete early in their college careers.

#### Bachelor of Science Degree Curriculum

PSYCHOLOGY—Consists of at least 51 semester hours, of which 30 must be in psychology and a minimum of 21 hours in related courses to be approved by the advisor in consultation with the student. Required courses in psychology are 100, 230 and 290; one course from among 315, 341, 350; one course from among 323, 324 or 325; and at least two courses from the 400-level course offerings. Required related courses are MA 141 and 142 or their equivalents, two semesters of physical science, and two semesters of biological science. Physical sciences are considered to encompass physics, chemistry, geology and astronomy. Biological sciences are considered to encompass biology, zoology, physiology and microbiology.

#### Departmental Minor Teaching Field Requirements (Secondary Education)

Consists of 18 semester hours of credit taken in consideration of the prerequisites listed for courses.

#### Departmental Graduate Programs

The Department of Psychology offers programs leading to the degree of Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

## PSYCHOLOGY (PY)

Courses which may be applied toward the General Studies requirement in science and mathematics.

**PY 112 Introduction to the Experimental Analysis of Behavior.** Basic principles of behavior analysis. Prerequisite: PX 100. Three lectures, 2 hours laboratory. Credit, 4 hours.

**230 Introduction to Statistics.** Basic concepts in descriptive and inferential statistics, emphasizing applications to psychology. Required for psychology majors. Prerequisite: PX 100. Credit, 3 hours.

**290 Experimental Psychology.** Planning, execution, analysis and reporting of behavioral experiments. Survey of literature, procedures and instruments in representative areas of psychological research. Required for psychology majors. Prerequisite: PY 230 or equivalent. Credit, 4 hours. Three lectures, 3 hours laboratory.

**323 Sensation and Perception.** Research literature and theories of sensory processes and perception. Prerequisites: PX 100, PY 230 or equivalent; PY 290 required for majors, recommended for nonmajors. Credit, 3 hours.

**324 Theories of Learning.** Contemporary theories and empirical data in human and animal learning. Prerequisites: PX 100, PY 230 or equivalent; PY 290 required for majors, recommended for nonmajors. Credit, 3 hours.

**325 Introduction to Physiological Psychology.** Physiological variables in the control of behavior. Prerequisites: PX 100, PY 230 or equivalent; PY 290 required for majors, recommended for nonmajors. Credit, 3 hours.

**330 Statistical Methods.** Advanced application of statistics to psychology. Highly recommended for students interested in attending graduate school. Prerequisite: PY 230. Two lectures, 2 hours laboratory. Credit, 3 hours.

**420 Analysis of Behavior.** Methods and concepts of experimental research with lower animals and humans. Training in digital logic

control equipment. Lectures and laboratory. Prerequisite: PY 324. Credit, 3 hours.

**421 Child Psychology.** Experimental and theoretical literature in child development and behavior. Prerequisite: PX 341. Credit, 3 hours.

**422 Analysis of Human Learning.** Theory and research in human learning. Prerequisite: PY 324. Credit, 3 hours.

**423 Comparative Psychology.** Generality of behavioral laws throughout the animal kingdom, as well as behaviors specific to different species. Lectures and laboratory. Prerequisite: PY 325 or consent of instructor. Credit, 3 hours.

**425 Physiological Methods in Psychology.** Application of combined methods from psychology and physiology to the analysis of behavior. Individual participation in projects investigating specific topics in physiological psychology. Prerequisite: PY 325. Two lectures, 3 hours laboratory. Credit, 3 hours.

**440 Directed Experience with Children.** Special studies adapted to the needs of the student, including experience with play therapy when the student has sufficient background preparation. Prerequisite: PX 341 or approval of instructor. Credit, 3 hours.

**498 Pro-Seminar.** Credit, 3 hours. The following topics are regularly offered by the Department:

- (a) Neuroanatomy.
- (b) Neurophysiology. Prerequisite: Neuroanatomy.
- (c) Neuropharmacology. Prerequisite: PY 325.
- (d) Biological Bases of Behavior. Prerequisite: PY 325.

**512 Learning.** Principles and theories of learning, emphasizing research literature. Credit, 3 hours.

**514 History of Psychology.** Historical development of psychology as a science and profession. Credit, 3 hours.

**520 Advanced Experimental Analysis of Behavior.** Contemporary research literature in the experimental analysis of behavior. Prerequisite: PY 320. Credit, 3 hours.

**521 Human Learning.** Research methods and findings in the field of human learning. Prerequisite: PY 512. Credit, 3 hours.

**522 Methods and Instrumentation in Psychological Research.** Electronic and electro-mechanical instrumentation in psychological research, including training in the programming and use of the departmental computer. Prerequisite: approval of instructor. Credit, 3 hours.

**523 Motivation.** Contemporary research and theories in the field of motivation. Credit, 3 hours.

**524 Advanced Physiological Psychology.** Theories of physiological mechanisms and brain function in behavior. Prerequisite: PY 325 or pro-seminar in Neuroanatomy and Neurophysiology. Credit, 3 hours.

**526 Physiology of Motivation.** Analysis of physiological mechanisms involved in states such as hunger, thirst, fear and sex motivation. Prerequisite: approval of instructor. Credit, 3 hours.

**527 Behavioral Pharmacology.** Problems and methods of drug research from the standpoint of experimental psychology. Prerequisite: PY 325. Credit, 3 hours.

**528 Sensation and Perception.** Principles of sensory and perceptual processes, emphasizing research literature. Credit, 3 hours.

**529 Inferential Statistics.** Principles of statistical inference emphasizing applications to psychological research. Credit, 3 hours.

**530 Intermediate Statistics.** Continuation of PY 529. Psychological statistics emphasizing principles of experimental design. Prerequisite: PY 529 or equivalent. Credit, 3 hours.

**533 Quantitative Methods in Psychology.** Logic, procedures and problems of psychological measurement. Nature of variables, functional

relations, scaling, curve fitting, reliability, and validity as used in psychological research and testing. Prerequisite: PY 330. Credit, 3 hours.

**535 Perception and the Cognitive Processes.** Contemporary research literature in the psychology of cognition. Prerequisites: PY 528 and approval of instructor. Credit, 3 hours.

**536 Thinking and Problem Solving.** Contemporary research literature in conceptual behavior, reasoning, problem solving and memory. Prerequisites: PY 512 and consent of instructor. Credit, 3 hours.

**540 Developmental Psychology.** Basic principles, data and methods in the study of human development. Prerequisite: PX 341 or 342. Credit, 3 hours.

**550 Advanced Social Psychology.** Research and concepts concerning social interaction. Analysis of individual behavior as affected by social variables. Prerequisite: PX 350 or equivalent. Credit, 3 hours.

**551 Research Methods in Social Psychology.** Review of research techniques. Laboratory and field research analyzed; applications to specific topics. Prerequisite: PY 550, or equivalent. Credit, 3 hours.

**553 Socialization and Social Influence.** Analysis of the enculturation process. Various modes and interpersonal processes by which the social context exerts influence over the individual. Prerequisite: PY 550. Credit, 3 hours.

**554 Social Dispositions and Interpersonal Behavior.** Theory and assessment of dispositional factors in the individual. Examination of formation, functioning, and change of motivational and stylistic factors and their relationships to social behavior. Credit, 3 hours.

**556 Cognitive Social Psychology.** Topics in cognitive social psychology such as impression formation, interpersonal perception, decision processes, cognitive organization, interpersonal attraction. Prerequisite: PY 550. Credit, 3 hours.

**558 Group Dynamics.** Theories and methods of group leadership, group effectiveness, communication within groups, relations between groups and individual members. Prerequisite: PX 350. Credit, 3 hours.

**560 Theories of Personality.** Critical analysis of theories of personality currently significant in psychology. Prerequisite: PX 315. Credit, 3 hours.

**564, 565 Somatopsychology.** Fact and theory in the psychological aspects of chronic illness, physical disability and mental retardation. Credit, 3 hours each semester.

**568 Play Therapy.** Methods and theories of play therapy with parallel supervised laboratory, experiences in play therapy. Conferences with parents and teachers. Prerequisite: approval of instructor. Two lectures, 2 hours laboratory. Credit, 3 hours.

**571, 572 Evaluation of Abnormal Behavior.** Measurement theory and research relating to clinical assessment techniques, especially personality and intelligence tests. Supervised practice in the various assessment procedures. Prerequisite: admission to clinical Ph.D. program. Credit, 3 hours each semester.

**573 Development of Abnormal Behavior.** Theory and research relating to the contribution of psychological, social, physiological and genetic factors to the development and persistence of abnormal behavior. Prerequisite: PY 571. Credit, 3 hours.

**574, 575 Modification of Abnormal Behavior.** Major current theories and methods used in modifying abnormal behavior including traditional psychotherapy and behavior therapy, emphasizing research literature and applications to clinical research. Prerequisite: Prior or concurrent enrollment in 571, 572. Credit, 3 hours each semester.

**576, 577 Clinical Practicum.** Supervised experience in the application of assessment procedures, psychotherapy and behavior modification techniques with children and

adults. Prerequisite: PY 574, 575. Credit, 3 hours each semester.

**578 Experimental Personality.** Laboratory course investigating problems in experimental personality research with emphasis on providing skills necessary for independent work in personality research. Prerequisite: PY 573. Credit, 3 hours.

**581 Theory and Research in Child Behavior.** Advanced theory and methodology pertaining to the study of children, emphasizing research findings and their implications. Prerequisite: advanced standing in clinical Ph.D. program or approval of instructor. Credit, 3 hours.

**583 Mediation Models in Clinical Psychology.** Theory and research in development of verbal and nonverbal language, communication processes, imagery, associative processes, construct systems and related phenomena. Prerequisite: advanced standing in clinical Ph.D. program or approval of instructor. Credit, 3 hours.

**584 Advanced Treatment Methods.** Advanced theory, research and techniques of psychological treatment methods. Prerequisites: PY 574, 575, advanced standing in clinical Ph.D. program or approval of instructor. Credit, 3 hours.

**585 Social Factors in Clinical Psychology.** Role of social and cultural factors in determining behavior; examination of research in epidemiology, anthropology and familial patterns, emphasizing research implications for the prevention of abnormal behavior. Prerequisite: advanced standing in clinical Ph.D. program or approval of instructor. Credit, 3 hours.

**586 Advanced Clinical Assessment.** Selected topics in research literature dealing with clinical assessment and prediction. Prerequisites: PY 571, 572; advanced standing in clinical Ph.D. program or approval of instructor. Credit, 3 hours.

**587 Learning and Motivational Approaches to Personality.** Application of major theories of learning and motivation to the analysis of

personality phenomena. Prerequisite: advanced standing in clinical Ph.D. program or approval of instructor. Credit, 3 hours.

**589 Application of Operant Techniques to Clinical Problems.** Literature pertaining to the application of operant conditioning methods to the modification of behavior in a clinical setting. Supervised training in the application of such methods to institutionalized clinical populations such as autistic children, retarded children, and adult psychotics. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours.

## PSYCHOLOGY (PX)

Courses which may be applied toward the General Studies requirement in social and behavioral sciences.

**PX 100 Introduction to the Science of Psychology.** Major areas of theory and research in psychology. Required for psychology majors. Credit, 3 hours.

**270 Psychology of Adjustment.** Principles of mental health, adjustment, conflict, stress and coping processes derived from clinical and experimental research. Prerequisite: PX 100. Credit, 3 hours.

**315 Personality Theory and Research.** Definition and description of personality in terms of theoretical and methodological approaches. Prerequisite: PX 100. Credit, 3 hours.

**341 Developmental Psychology.** Behavior development analyzed in terms of psychological principles. Current research in human development. Prerequisite: PX 100. Credit, 3 hours.

**350 Social Psychology.** Individual and social behavior. Analysis of concepts and research dealing with social variables. Prerequisite: PX 100. Credit, 3 hours.

**380 Applied Psychology.** Application of psychological principles and procedures to problems in personnel selection and training,

human factors in engineering, marketing and other topics of commercial interest. Prerequisite: PX 100. Credit, 3 hours.

**414 History of Psychology.** Historical development of psychology from its philosophical beginnings to the present. Prerequisite: PY 290. Credit, 3 hours.

**442 Psychology of Adolescence.** Methods and findings of recent studies of the development, growth and problems of adolescents, with implications for education. Prerequisite: PX 341. Credit, 3 hours.

**458 Group Dynamics.** Theories and methods of group leadership, group effectiveness, communication within groups and relations between groups and individual members. Prerequisite: PX 350. Credit, 3 hours.

**459 Attitudes and Attitude Change.** Concept of attitude. Review of theory and research including techniques of measurement. Analysis of attitude change at both mass and individual levels. Persuasive communication, balance models, cognitive, perceptual and motivational determinants. Prerequisite: PX 350, Credit, 3 hours.

**466 Abnormal Psychology.** Theory and research related to the understanding of abnormal behavior. Prerequisite: PX 315. Credit, 3 hours.

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## Sociology

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**Professors:**

HOULT (SS 107), GUILLOT, HARWARD,  
HUDSON, KUNKEL, LINDSTROM, MANHEIM,  
MAYER, OWEN

**Associate Professors:**

ANDERSON, GORDON, LEYBA, McNALL,  
PARKER, PFUHL, SEBALD, WHITAM

**Assistant Professors:**

FAUSEL, HARDERT, HENZE, LITTLE,  
NAGASAWA, SNOW

### Departmental Major Requirements

#### Bachelor of Arts and Bachelor of Science Degree Curriculums

SOCIOLOGY – Departmental requirements are the same for the Bachelor of Arts and for the Bachelor of Science degrees; see the College of Liberal Arts section of this catalog for the additional requirements for each degree. The departmental requirement for either degree consists of 45 semester hours of credit of which 30 must be in sociology and 15 in closely related fields to be approved by the advisor in consultation with the student. The 30 hours must include SO 101 or 301, 390, 483, 490 and at least one course from at least three of the following five areas: institutional forms and processes, demography and ecology, social problems, social organization and social psychology (details available in the department office). At least 18 semester hours must be in upper division courses.

#### Social Welfare Major

The requirements for the social welfare major

are the same as those for the sociology major except that the required courses are: SO 101 or 301, 371, 378, 379, 471 or 390 and 490, 478 and 479. Social welfare majors will be designated as such on their transcripts and in graduation records.

The curriculum is designed to meet the needs of students who: 1) wish to gain a knowledge of the institution of social welfare, and social work methods for intelligent citizen concern and interdisciplinary participation in social welfare issues and programs; 2) wish to take entry level positions in the field of social welfare or intend to go on to graduate school. Special emphasis is given to the problems encountered by minority groups in the Southwest.

The social welfare curriculum integrates and operationalizes content from other disciplines as well as presents its own body of knowledge, skills and values in the areas of: 1) human growth and behavior; 2) society and social interaction; 3) philosophy and values which underlie the social welfare system; 4) methods of problem solving and arts of communication; 5) social welfare as a social institution and social work as a profession.

#### Departmental Minor Teaching Field Requirements (Secondary Education)

SOCIOLOGY – Consists of 18 semester hours of credit, at least six of which will be upper division. SO 101 or 301 is required. The remaining 15 hours must be approved by the sociology advisor in consultation with the student, and must include at least one course from at least three of the following five areas: institutional forms and processes, demography and ecology, social problems, social organization and social psychology (details available in the department office).

**PUBLIC SAFETY EMPHASIS** — A public safety emphasis is available for law enforcement and fire fighting personnel in either the Bachelor of Arts or Bachelor of Science major in sociology. The 30 hours must consist of SO 340, 360, 440, 446, 447, and 470 in addition to SO 101 or 301, 390, 483 and 490. Applicable courses taken outside the Department of Sociology may be used to meet the requirement of 15 hours in closely related fields approved by the advisor in consultation with the student. Upon graduation, those successfully completing the program will receive suitable recognition on their transcripts.

### Departmental Graduate Programs

The Department of Sociology offers programs leading to the degree of Master of Arts. Consult the *Graduate Catalog* for requirements.

**SO 101 Introductory Sociology.** Fundamentals of sociology, organization of human groups and society, processes of interaction and social change. Not open to students who have credit for SO 301. Credit, 3 hours.

**250 The Community.** Development and organization of institutions in human communities of various types. Prerequisites: SO 101. Credit, 3 hours.

**251 American Society.** Systematic analysis of the major institutions of economic activity, political structure, science, education and religion in contemporary America. Prerequisite: SO 101. Credit, 3 hours.

**271 Social Welfare.** Observation and analysis of community welfare services. Two lectures, 3 hours field trips and discussion. Not open to students who have credit for SO 470. Credit, 3 hours.

**272, 273 Current Social Welfare Problems and Communications.** Current social welfare issues

and development of the communication skills needed in social work. Prerequisite: approval of instructor. Credit, 3 hours each semester.

**301 Principles of Sociology.** Intensive and critical analysis of the concepts of sociology. Not open to students who have credit for SO 101. Credit, 3 hours.

**305 Courtship and Marriage.** A functional approach to marriage; courtship, engagement, marital adjustment. Credit, 3 hours.

**332 The Modern City.** Growth, characteristics and problems of the modern city. Prerequisite: SO 101 or 301. Credit, 3 hours.

**333 Population Problems.** Theories of population change; births, deaths, migration; population policies. Prerequisite: SO 101 or 301. Credit, 3 hours.

**340 Sociology of Deviant Behavior.** Introduction to and analysis of deviant behavior. Delineation of the sociological and social psychological factors which give rise to deviant behavior such as suicide, drug addiction, homosexuality, prostitution, etc. Prerequisite: SO 101 or 301. Credit, 3 hours.

**341 Modern Social Problems.** Race relations, poverty, unemployment and other current issues. Credit, 3 hours.

**351 Industrial Sociology.** Social and cultural analysis of industry. Occupational roles, status and social participation of workers. Prerequisite: SO 101 or 301. Credit, 3 hours.

**352 Social Change.** Patterns of social change, resistance to change and change-producing agencies and processes. Prerequisite: SO 101 or 301. Credit, 3 hours.

**360 The Social System and the Individual.** Interaction patterns between the sociocultural order and individuals; socialization process; norms, roles and statuses; collective behavior. Prerequisite: SO 101 or 301. Credit, 3 hours.

**362 Sociology of Adolescence.** Cultural values and the social processes that help explain the development of the phenomenon of modern adolescence, including investigation of adol-

escent subcultures and cross-cultural references. Prerequisite: SO 101 or 301. Credit, 3 hours.

**371, 372 Social Welfare as a Social Institution.** Development of social welfare as an institution meeting changing human and system needs; analysis of present-day philosophy and function. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor; 371 prerequisite for 372. Credit, 3 hours each semester.

**378 Scientific Foundations of Social Work.** Use of the findings of the social, biological and psychological sciences as a foundation for helping individuals to enhance their social functioning. Prerequisite: SO 371. Credit, 3 hours.

**379 Field Experience in Social Work with Community Groups.** Four to six hours a week supervised experience in community projects and one hour a week class meeting to analyze basic concepts of social action. Prerequisites: SO 371 and 378, or approval of instructor. Credit, 3 to 6 hours.

**390 Social Statistics.** Application of statistical methods to research problems in sociology; problems of scale-construction, measure of central tendency and variability, simple relationship statistics, sampling and presentation of data. Prerequisites: SO 101 or 301; MA 205, or two years of high school math. Credit, 3 hours.

**401 Comparative Sociology.** Cross-cultural study of basic social institutions; methodology of cross-cultural research; case studies of three or four different societies, with particular concentration on one society other than the United States. Prerequisites: six hours in sociology including SO 101 or 301, or AN 102, or approval of instructor. Credit, 3 hours.

**410 Sociology of Religion.** Interrelationship of culture, society and religion; religion and social stratification; religion and economic and political institutions; social change and religion. Emphasis on American society and institutions. Prerequisites: six hours in sociology

including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**415 The Family.** The family considered from the institutional viewpoint; its historical development, and its adaptation to a changing culture; the family system in many cultures. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**416 Marriage Problems in Contemporary Society.** Marital and family problems in today's society from the viewpoint of personal and cultural adjustment. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**432 Human Ecology.** Patterns and laws of societies' adjustments to the physical environment; distribution of communities and institutions. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**433 Demographic Methods.** Science of population analysis; problems in measurements of the size, composition and changes in population. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**440 Racial and Ethnic Minorities.** Analysis of problems of minorities in the United States and in other racially and ethnically heterogeneous societies. Evaluation of theories of prejudice and of research dealing with discrimination, desegregation and assimilation. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**446 Criminology and Delinquency.** Causation of crime; juvenile delinquency; classes of crime; criminal as a social type. Prerequisites: SO 101 or 301, and 340, or approval of instructor. Credit, 3 hours.

**447 Sociology of Corrections.** Theories of punishment; methods of dealing with convicts; police, courts, prisons, probations and parole.

Prerequisite: SO 446, or approval of instructor. Credit, 3 hours.

**448 Gerontology.** Social processes in aging and their relationship to the physical changes. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**451 Sociology of Occupations and Professions.** Rise of occupational groups and professions, their role in modern societies, and their impact on the development of newly industrializing nations. Prerequisite: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**452 Sociology of Complex Organizations.** Sociological studies of government agencies, industrial firms, labor unions, military establishments and other large-scale organizations. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**453 Social Class and Stratification.** Social classes and the function of these groupings in a society. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**454 The Afro-American in Modern Society.** Social and cultural heritage of Black Americans; achievements and current trends. Prerequisite: approval of instructor. Credit, 3 hours.

**455 Collective Behavior.** Analysis of the social causes and consequences of such noninstitutionalized forms of behavior as crowds, cults, publics, social movements and revolutions. Prerequisites: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**462 Social Control.** Significance of social control in society, and the various methods used by individuals and groups to control others. Prerequisite: SO 360 or approval of instructor. Credit, 3 hours.

**463 Small Group Interaction.** Theoretical and applied aspects of social interaction, empha-

sizing the processes involved in small groups. Prerequisite: SO 360 or approval of instructor. Credit, 3 hours.

**470 Community Resources.** Existing social agencies, the needs they meet and how they meet them. Especially designed for teachers, nurses, police and related professions. Prerequisite: approval of instructor. Not open to students who have credit for SO 271. Credit, 3 hours.

**471 Use of Research in Social Work.** Statistical and research principles and methods, emphasizing their application to social work. Prerequisites: SO 371, 378, 379, or approval of instructor. Credit, 3 hours.

**474 Approaches to Problems Encountered by Chicanos.** Exploration of social problems facing Mexican-Americans; analysis of programs designed to meet the needs of Mexican-Americans. Prerequisite: SO 101 or 301. Credit, 3 hours.

**478 Social Intervention.** Social work methods of problem solving as applied to individuals, groups and communities. Prerequisites: SO 371, 378 or approval of instructor. Credit, 3 hours.

**479 Field Experience in Social Work with Individuals and Professional Agencies.** Two half-days a week supervised field experience in a social agency and a weekly two-hour class meeting to analyze basic concepts and current issues. Prerequisites: SO 371, 378, 379, 478 or approval of instructor. Credit, 4 to 8 hours.

**483 History of Social Thought.** Social thought in human culture. Background of modern sociology. Prerequisite: six hours in sociology including SO 101 or 301, or approval of instructor. Credit, 3 hours.

**490 Sociological Research.** Methods of sociological research, including the fundamental assumptions underlying research, and some practical experience in research design, data collection techniques and data analysis. Prerequisites: SO 101 or 301, 390, or approval of instructor. Credit, 3 hours.

**491 Community Surveys and Analysis.** Application of sample survey methods to the study of communities and large-scale organizations. Analysis of community problems through an actual field study. Prerequisites: SO 101 or 301, 490, or approval of instructor. Credit, 3 hours.

**494 Intermediate Social Statistics.** Multivariate and correlational analysis as used in survey research, sociological experiments and field studies. Prerequisites: SO 390 or equivalent. Credit, 3 hours.

**498 Pro-Seminar.** Topics to be selected. Credit, 3 hours.

**500 Research Methods.** Prerequisite: SO 490, or approval of instructor. Credit, 3 hours.

**515 Studies of the Family.** Current developments in the study of marriage and the family. Prerequisite: approval of instructor. Credit, 3 hours.

**532 Studies in Ecology and Demography.** Current literature in ecology and demography; group and individual projects. Prerequisites: SO 432, 433, or approval of instructor. Credit, 3 hours.

**546 Criminology and Criminal Law.** History of criminal law and punishment as a means of social control; the use of indeterminate sentences, probation and parole; the legal foundations of the juvenile court; the law of arrest, search and seizure; and the role of psychiatry in criminal law. Prerequisite: approval of instructor. Credit, 3 hours.

**552 Social Aspects of Economic Development.** Social prerequisites, concomitants and effects of industrialization, and the evaluation of recent research in these areas. Prerequisite: approval of instructor. Credit, 3 hours.

**585 European Sociological Theory.** Contributions to the development of sociological theory by major European scholars, emphasizing the 19th century and early 20th century. Prerequisite: SO 483, or equivalent, or approval of instructor. Credit, 3 hours.

**586 Current Sociological Theory.** Contempo-

rary issues in sociology; their implications for future research and theory. Prerequisite: approval of instructor. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Topics may be selected from the following:

- (a) Ecology and Demography
- (b) Social Problems Theory
- (c) Social Organization
- (d) Social Psychology
- (e) Social Conflict
- (f) Philosophical Issues in Sociological Theory
- (g) Methodological Problems
- (h) Sociology as an Academic Discipline

**595 Methodological Issues in Sociology.** Basic methodological issues in the application of scientific methods to the study of human social life. Emphasis on limited number of major works, with contrasting approaches to issues. Prerequisite: SO 490 or approval of instructor. Credit, 3 hours.

**Special Graduate Courses:** 590, 591, 592, 593. (See pages 46-47.)

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## Zoology

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### Professors:

GERKING (LSC 171), BENDER, BERTKE, CASTLE, CAZIER, COLE, HANSON, LANDERS, STAHNKE, WOOLF

### Associate Professors:

CLOTHIER, FOUQUETTE, HASBROUCK, MINCKLEY, PATTERSON, PIKE, RASMUSSEN

### Assistant Professors:

CHURCH, HADLEY, JUSTUS, MURDOCK, OHMART

### Lecturer:

GREEN

## Departmental Major Requirements

The department offers course work in the environmental, systematic, physiological, genetic, morphological, developmental and behavioral areas of zoology. Organisms are studied at the molecular, cellular, individual and population levels of organization. Majors are expected to attain a basic knowledge in each of these areas and levels.

## Bachelor of Science Degree Curriculum

**ZOOLOGY, ENTOMOLOGY** – Consists of a minimum of 28-30 semester hours of credit.

Required courses are ZO 100, 250 or ET 300, ZO 270 or 330, 360 or 460-462 and 461-463, 425 or 428, 430; BI 340, 445. The following supplementary courses amounting to an equivalent of 44-46 semester hours of credit are required; one year of a foreign language; BO 100; CH 113, 115, 331, 332, 335, 336; EE 226; MA 141, 142 or 121; PH 111-112.

**WILDLIFE BIOLOGY** – Consists of a minimum of 57 semester hours of credit. Required courses are BO 100, 270, 420; ZO 100, 250, 270, 360, 427; BI 217, 320, plus the following courses under the Wildlife Management Option (ZO 411, 412; PS 338) or under the Fisheries Management Option (ZO 413, 414; BI 426). To complete his requirements under either option, the student, in consultation with his advisor, must select a minimum of four courses from the following: ZO 411, 412, 413, 414, 420, 424, 471, 472, 473, 474; GL 100; PS 232; ET 400; BO 450; CE 461. Required supplementary courses amounting to an equivalent of 20-22 semester hours of credit are: CH 101, 231; MA 141; PH 101 or MA 142; BI 415 or MA 226; EE 226.

## Departmental Graduate Program

The Department of Zoology offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

### BIOLOGY

**BI 100 The Living World.** Biological principles as illustrated by the areas of behavior, biogeography, ecology, evolution, morphology, physiology, reproduction and development, and taxonomy. Does not meet science requirement in pre-professional curriculum. Not open to majors in the biological sciences. Three lectures, 2 hours laboratory. Credit, 4 hours.

**217 Biological Resource Management.** Environmental quality, its maintenance and values, emphasizing renewable biological resources. Prerequisites: 8 hours of biological courses and approval of instructor. Credit, 3 hours.

**218 History of Medicine.** From Babylonian times through present. For premedical and pre dental students. Credit, 1 hour.

**310 Special Techniques in Biology.** Approval of instructor and chairman of department required. May be repeated for credit. Credit, 1-3 hours.

**318 History of Biology.** Development of biological concepts from about 2000 B.C. through the present. Prerequisite: 12 hours of biological sciences. Credit, 2 hours.

**320 Fundamentals of Ecology.** Basic concepts in ecology. Organization, functioning and development of ecological systems — energy flow, biogeochemical cycling, environmental relations, population dynamics. Prerequisites: BO 100; ZO 100 or approval of instructor. Credit, 3 hours.

**330 Ecology and Conservation.** Ecological and biological concepts of conservation; use of basic and applied ecology to understand man-made ecological problems and the purpose for conservation. Three lectures, 2 field trips. Credit, 3 hours.

**340 General Genetics.** Science of heredity and variation. Prerequisite: BI 100 or BO 100 or ZO 100 or equivalent. Credit, 3 hours.

**412 Biological Electron Microscopy.** Methods of preparation of biological materials for electron microscopic examination. Theory and use of the electron microscope. Prerequisite: approval of instructor. Two lectures, 6 hours laboratory. Credit, 4 hours.

**415 Biometry.** Statistical methods applied to biological problems, including design of experiments, estimation, tests of significance, analysis of variance, regression, correlation, chi square and bioassay. Prerequisite: MA 141 or equivalent. Two lectures, 6 hours laboratory. Credit, 4 hours.

**426 Limnology.** Dynamics of inland waters, stressing the interrelations of climatic, geological, topographical, physical and chemical factors with special reference to aquatic life. Prerequisites: BO 100; CH 113; ZO 250. Credit, 3 hours.

**427 Limnology Laboratory.** Three hours laboratory. Prerequisites: BI 426 or concurrent enrollment and approval of instructor. Credit, 1 hour.

**429 Advanced Limnology.** Recent literature, developments, methods and limnological theory; field and laboratory application to some particular topic in limnology. Prerequisite: BI 426. Credit, 3 hours.

**441 Cytogenetics.** Chromosomal basis of inheritance. Prerequisite: BI 340. Credit, 3 hours.

**442 Cytogenetics Laboratory.** Microscopic analysis of meiosis, mitosis and aberrant cell division. Prerequisites or concurrently: BI 441 and graduate status. Four hours laboratory. Credit, 2 hours.

**443 Physiological Genetics.** Nature and function of the gene. Prerequisites: BI 340; organic chemistry. Credit, 3 hours.

**445 Organic Evolution.** Principles and processes of evolution. Prerequisites: 12 hours of biological sciences, including BI 340 and a

course in systematics. Credit, 3 hours.

**480 Methods of Teaching Biology.** Methods of instruction, experimentation, organization and presentation of appropriate content in biology. Prerequisites: SE 311 or concurrently and 20 hours in the biological sciences. Two lectures, 2 hours laboratory. Credit, 3 hours.

**520 Biology of the Desert.** Factors affecting plant and animal life in the desert regions and adaptations of the organisms to these factors. Prerequisite: 10 hours of biological sciences and/or approval of instructor. Credit, 2 hours.

**521 Biology of the Desert Laboratory.** Three laboratory hours. Prerequisites: BI 520 or concurrent enrollment and approval of instructor. Credit, 1 hour.

### ENTOMOLOGY

**ET 300 General Entomology.** Form, activities and classification of insects. Prerequisite: ZO 100 or equivalent. Three lectures, 3 hours laboratory. Credit, 4 hours.

**400 Aquatic Insects.** Systematics and ecology of aquatic insects. Prerequisite: ZO 250 or ET 300. Credit, 3 hours.

**411 Applied Entomology.** Recognition, economic importance, life history and habits of harmful and beneficial insects. Properties, mode of action and recommended uses of commercially important insecticides considered. Prerequisite: ET 300 or approval of instructor. Two lectures, 4 hours laboratory or field trips. Credit, 4 hours.

**424 Medical Entomology.** Identification, ecology, life histories, and host-parasite relationships of insects of medical and veterinary importance. Prerequisite: ET 300 or approval of instructor. Two lectures, 3 hours laboratory. Credit, 3 hours.

**425 Insect Bionomics.** Collection of insects in their natural habitats, emphasizing ecology, life histories and field recognition. Prerequisites: BO 100; ET 300 or approval of instructor. One lecture, 6 hours laboratory. Credit, 3 hours.

**430 Insect Morphology.** Morphology of typical insects including both external and internal structure. Prerequisite: ET 300. Two lectures, 6 hours laboratory. Credit, 4 hours.

**450 Systematic Entomology.** Classification of insects; taxonomic categories and procedures; bibliographical methods; nomenclature, museum practices. Prerequisite: ET 300. Two lectures, 6 hours laboratory. Credit, 4 hours.

**502 Entomology for Teachers.** Methods of collection, recognition and preparation of insects for classroom use. Care and handling of living as well as pinned specimens. Emphasis on Arizona insects and their biology. Prerequisite: 10 hours in biology and/or approval of instructor. Two lectures, 3 hours laboratory. Credit, 3 hours.

**550 Insect Identification.** Detailed consideration of classification and literature of a selected order of insects with practice in identification of adult and immature forms. Prerequisites: ET 300, 450. Nine hours laboratory. Credit, 3 hours.

## ZOOLOGY

**ZO 100 General Zoology.** Principles of zoology. Three lectures, 3 hours laboratory. Credit, 4 hours.

**201 Human Anatomy-Physiology.** Consideration of the structure and dynamics of the human mechanism. Three lectures, 3 hours laboratory. Credit, 4 hours.

**202 Human Anatomy-Physiology.** Prerequisite: ZO 201 or approval of instructor. Three lectures, 3 hours laboratory. Credit, 4 hours.

**250 Invertebrate Zoology.** Characteristics, life cycles, habits, economic importance and evolution of the major groups of invertebrate animals. Prerequisite: ZO 100 or approval of instructor. Two lectures, 4 hours laboratory. Credit, 4 hours.

**270 Vertebrate Zoology.** Characteristics, classification, evolution and natural history of the major groups of vertebrate animals. Prerequisite: ZO 100 (250 recommended). Two lec-

tures, 4 hours laboratory. Credit, 4 hours.

**300 Biogenetics of Man.** Concepts of ecology, heredity and evolution and their importance and influence in human affairs. Not offered for credit to majors in the biological sciences. Credit, 4 hours.

**310 Problems in Zoology.** Qualified undergraduates may formulate and investigate a specific zoological problem under the direction of a faculty member. The investigation may involve library, field, laboratory or a combination of these techniques. Prerequisites: formal conference with the faculty member and approval of the problem and techniques by the faculty member and the departmental chairman. Credit, 1-3 hours. Y or fail only.

**311 Animal Microtechnique.** Zoological microtechnique, including the preparation for microscopic examination of animal structures, tissues, cells and whole mounts. Prerequisite: ZO 100. 6 hours laboratory. Credit, 3 hours.

**330 Chordate Anatomy.** Structure, development and homology of the chordata. Prerequisites: ZO 100 (270 recommended). Two lectures, 6 hours laboratory. Credit, 4 hours.

**341 Human Genetics.** Human heredity and variation, emphasizing population and medical genetics. Prerequisites: BI 100 or ZO 100 and MA 141 or equivalent. Credit, 3 hours.

**360 Basic Physiology.** Basic physiological mechanisms of the higher vertebrates. Prerequisites: ZO 100, 270; CH 231 or equivalent. Two lectures, 3 hours laboratory. Credit, 3 hours.

**400 Poisonous Animals of Arizona.** Form, activities and identification of venomous animals of Arizona and others thought venomous. Prerequisites: ZO 100 or equivalent and approval of instructor. Two lectures, 3 hours laboratory. Credit, 3 hours.

**411 Wildlife Management.** Principles and theory of wildlife management. Prerequisites: ZO 471, 472 or approval of instructor. Three lectures, 3 hours laboratory or field trip. Credit, 4 hours.

**412 Wildlife Management.** Practices and techniques of wildlife management. Prerequisite: ZO 411. Two lectures, 6 hours laboratory or field trip. Credit, 4 hours.

**413 Fisheries Management.** Principles and theory of fisheries management. Prerequisite: 10 hours of biology. Three lectures, 3 hours laboratory or field trip. Credit, 4 hours.

**414 Fisheries Management.** Practices and techniques of fisheries management. Prerequisite: ZO 413. Two lectures, 6 hours laboratory or field trip. Credit, 4 hours.

**420 Field Zoology.** Field techniques and experience in collection and preparation of zoological specimens. Taught only in summer session; one week of preparation and four weeks in the field. Prerequisites: 20 hours in biological sciences and approval of instructor. Credit, 6 hours.

**424 Parasitology.** Morphology, physiology and life histories of animal parasites, therapeutics, control and host-parasite relationships. Prerequisite: ZO 250 or approval of instructor. Three lectures, 3 hours laboratory. Credit, 4 hours.

**425 Animal Ecology.** Interrelations of animals and their environments. Prerequisite: BI 320. Credit, 3 hours.

**427 Animal Ecology Laboratory.** Three hours field and laboratory. Weekend field trips. Prerequisites: BI 320; ZO 425 or concurrent enrollment or permission of instructor, ZO 471 or 472. Credit, 1 hour.

**428 Biogeography.** Patterns and significance of world plant and animal distributions of the past and present. Credit, 3 hours.

**430 Embryology.** Animal development, emphasizing vertebrates. Prerequisites: ZO 100, 330 or approval of instructor. Two lectures, 4 hours laboratory. Credit, 4 hours.

**432 Animal Cytology.** Structure and function of the cell, based upon ultrastructural organization. Prerequisite: ZO 100. Credit, 3 hours.

**433 Animal Histology.** Microscopic study of

animal tissues and their identification. Prerequisite: ZO 330 or approval of instructor. Two lectures, 4 hours laboratory. Credit, 4 hours.

**450 Advanced Invertebrate Zoology.** Prerequisites: ZO 250 or equivalent and approval of instructor. Two lectures, 6 hours laboratory. Several weekend field trips. Credit, 4 hours.

**453 Protozoology.** Systematics and biology of protozoa. Prerequisite: ZO 250. Two lectures, 3 hours laboratory. Credit, 3 hours.

**460 General and Comparative Physiology.** Physiological phenomena of osmoregulation, thermoregulation, respiration, nutrition, excretion and intermediary metabolism. Prerequisites: 12 hours of zoology; organic chemistry. Credit, 2 hours.

**461 General and Comparative Physiology.** Physiological phenomena of circulation, bioelectricity, motor, sensory and integrative functions. Prerequisites: 12 hours of zoology; organic chemistry. Credit, 2 hours.

**462 General and Comparative Physiology Laboratory.** Prerequisites: ZO 460 or concurrent enrollment and approval of instructor. Three hours laboratory. Credit, 1 hour.

**463 General and Comparative Physiology Laboratory.** Prerequisites: ZO 461 or concurrent enrollment and approval of instructor. Three hours laboratory. Credit, 1 hour.

**465 Environmental Physiology.** Physiological responses and adaptations of animals to various aspects of the physical environment. Prerequisites: ZO 360, 425, 427. Credit, 3 hours.

**466 Environmental Physiology Laboratory.** Individually directed research applying instrumentation and techniques used in environmental adaptation. Prerequisites: ZO 465 or concurrent enrollment and approval of instructor. Credit, 1-2 hours.

**467 Venomology.** Harmful noxious secretions and the systematics and biology of the animals that produce them. Prerequisite: ZO 100 or approval of instructor. Two lectures, 3 hours laboratory. Credit, 3 hours.

**471 Ornithology.** Natural history and field study of birds, emphasizing Arizona species. Prerequisite: ZO 270 or approval of instructor. Two lectures, 3 hours laboratory. One weekend field trip. Credit, 3 hours.

**472 Mammalogy.** Classification, structure, habits, ecology and distribution of mammals, emphasizing North American forms. Prerequisite: ZO 270 or approval of instructor. Two lectures, 3 hours laboratory or field trip. One weekend field trip. Credit, 3 hours.

**473 Ichthyology.** Systematics and biology of recent and extinct fishes. Prerequisites: ZO 270, 425 or approval of instructor. Two lectures, 3 hours laboratory or field trip. Weekend field trip required. Credit, 3 hours.

**474 Herpetology.** Systematics and biology of recent and extinct reptiles and amphibians. Prerequisite: ZO 270 or 330. Two lectures, 3 hours laboratory or field trip. Credit, 3 hours.

**475 Natural History of the Higher Vertebrates.** Natural history of birds and mammals, emphasizing southwestern species. Prerequisites: BI 100 or ZO 100 and approval of instructor. Three lectures, 3 hours laboratory or field trip. Credit, 4 hours.

**510 Topics in Zoology.** Detailed presentation in the following areas of zoology: environmental, systematic, physiological, genetic, morphological, developmental, behavioral. Prerequisites: graduate standing and approval of instructor. May be repeated for credit. Credit, 2 hours.

**515 Populations.** Mathematical models in the description and analysis of populations and communities, including both genetical and ecological parameters. Prerequisites: ZO 425, 445; MA 142 or approval of instructor. Credit, 3 hours.

**560 Experimental Vertebrate Physiology.** Directed experiments to develop skill in the use of physiological equipment and in the handling of animals. Independent study project required. Prerequisite: approval of instructor. One lecture, 6 hours laboratory. Credit, 3 hours.

**562 Histo and Cytochemistry.** Identification and localization of compounds in tissues on a cytological scale. Prerequisites: ZO 360 or equivalent; organic chemistry. Two lectures, 4 hours laboratory. Credit, 4 hours.

**565 Advanced Parasitology.** Historical and analytical approach to the treatment of selected areas in the body of knowledge relating to parasites and parasitism. Prerequisites: MI 202; ZO 424. Credit, 3 hours.

**Special Graduate Courses:** 500, 590, 591, 592, 593, 594, 600, 700, 790, 791, 792, 799. (See pages 46-47.)

# College of Business Administration

GLENN D. OVERMAN, D.B.A.  
*Dean*

## Purpose

The primary purpose of the College of Business Administration is to prepare students for positions of responsibility in the business community. The undergraduate and graduate degree curricula are designed to provide (1) a basic background of general education helpful to informed, thinking citizens in a democracy, (2) a mastery of basic business tools and skills and an understanding of business procedures, and (3) a specialized and professional knowledge of a selected field of business. To attain these objectives in the undergraduate program, the curriculum has been devised so that the student completes 45 per cent of his work in general education and other nonbusiness courses and 45 per cent in courses offered by the College of Business Administration, with the remaining 10 per cent selected from either area by the student in consultation with his advisor.

The College is a member of the American Association of Collegiate Schools of Business, the official accrediting organization in the field of business administration. Both the undergraduate and graduate programs of the College of Business Administration are accredited by this association.

In addition to the regular degree curricula, other programs of study in the College are designed to meet special needs. Preparation for the teaching of business, office and distributive education subjects in secondary schools is offered in cooperation with the College of Education. Evening and extension courses are conducted for qualified persons who are regularly employed and who otherwise would be unable to enroll in college courses. Short courses and institutes on a noncredit basis are organized in cooperation with various business groups for the further-

ance of in-service training of employed personnel.

## Organization

The courses of instruction offered by the College of Business Administration are organized into groups in order that a related sequence may be established for the various subject fields.

For administrative purposes these fields are organized into the following departments: Accounting, Administrative Services, Economics, General Business Administration, Management, Marketing, Quantitative Systems.

The Bureau of Business and Economic Research is organized to help business meet the challenges of an increasingly complex economic and technical environment. In cooperation with faculty and students, government agencies, and the business community, it conducts and sponsors research projects. By functioning as the focus of the research and dissemination process in the College of Business Administration, the Bureau provides support for faculty research, opportunities for publication by faculty and advanced graduate students, and information for use by the business community.

The Center for Executive Development serves the needs of the community with continuing education programs designed for businessmen and is open to government officials and the general public.

The Dean's Advisory Council, a group of 21 distinguished Arizona business and professional leaders, provides liaison between the College and the business community. The Council meets regularly throughout the year with administrators, faculty and students to make recommendations as to how the College can be of greatest assistance in meeting community needs.

**Degrees**

**Bachelor's Degrees.** The College of Business Administration awards the Bachelor of Science degree upon successful completion of a four-year curriculum of 126 semester hours as prescribed on page 127. Students may select one of the following 11 fields of specialization:

- Accounting
- Advertising
- Economics
- Finance
- General Business Administration
- Insurance
- Management
- Marketing
- Office Administration
- Real Estate
- Quantitative Systems

Lower division students who wish to qualify to teach business, office and distributive education subjects at the secondary and post-secondary levels should major in pre-secondary business education. Upper division students should major in business education. This curriculum leads to the Bachelor of Arts in Education degree and certification for teaching business, office and distributive education subjects in Arizona schools. Courses to meet University and professional education requirements for this program are listed under the secondary curriculum section of the College of Education. Required business courses may be found on page 145.

**Master's Degrees.** The Master of Business Administration degree and Master of Science degree in the fields of Accounting and Economics are awarded upon successful

completion of programs detailed in the *Graduate Catalog*.

**Master of Business Administration Degree:** Designed to meet the needs of students who seek a broad, integrated program in the various functional fields of business. The program of study emphasizes the managerial responsibility of policy-formulation, problem-solving and decision-making. Students with undergraduate backgrounds in general education or engineering as well as those with bachelor's degrees in business administration will find the program well suited to their needs. Students without prior courses in business administration must complete approximately two years of study while those with an undergraduate degree in business administration may complete requirements in one calendar year.

**Master of Science in Accounting Degree:** Provides a specialized program emphasizing preparation for public accounting and college and university teaching, with sufficient flexibility to include courses in managerial, tax and governmental accounting, as well as in allied fields.

**Master of Science in Economics Degree:** A specialized program for students who desire to teach in colleges and universities, to prepare for research positions, or to take additional graduate work in economics. The Master's program in economics requires graduate work in macro-economic analysis, micro-economic analysis, and quantitative methods.

**Doctor of Business Administration Degree.** The Doctor of Business Administration degree is awarded upon successful completion of the program as described in the *Graduate Catalog*. Primary objectives of this degree program are to prepare persons for teaching and research in institutions of higher

learning, and to develop proficiency for effective service in a leadership capacity in either private business or government. The degree is granted upon the completion of high academic attainment in graduate study, an original research project presented in a dissertation, and comprehensive written and oral examinations.

**Bachelor of Science in Business Administration.** Students seeking a Bachelor of Science degree in the College of Business Administration must satisfactorily complete a curriculum of 126 semester hours as indicated below.

	<i>Semester Hours</i>
General Studies requirements and other general courses . . . . .	57
Business Administration core curriculum . . . . .	33
Field of specialization . . . . .	24
Electives . . . . .	12
Total . . . . .	126

**General Studies Requirements.** All students in the College of Business Administration are required to complete a total of 57 semester hours in general studies courses, with the designated minimum semester hours in each of the following fields. (Courses of a specialized, vocational, technical or professional nature may not be included.)

- Humanities and Fine Arts . . . . . 8 sem. hrs.  
Architecture, Art, Dance, Drama, English, Foreign Languages, Interdisciplinary Humanities, Music, Philosophy.
- Behavioral and Social Sciences . . . . . 15 sem. hrs.  
Agriculture, Anthropology, Cultural Geography, Economics, Education (Educational Foundations), Engineering, Health Education, History, Home Economics, Mass Communications, Political Science, Psychology (PX courses only), Sociology.

All students in the College of Business Administration must complete EC 201 and 202 Principles of Economics, as part of the 15 semester-hour minimum. The only other economics course that may be included among general studies and other general courses is EC 100, Development of the American Economic System.

Sciences and Mathematics . . . . . 8 sem. hrs.  
Botany, Chemistry, Engineering, Geology, Mathematics, Physical Geography, Physics, Psychology (PY courses only), Zoology.

All students in the College of Business Administration must complete MA 141

Mathematical Analysis, or a more advanced, approved course in mathematics, as part of the 8 semester-hour minimum.

Other general courses . . . . . 26 sem. hrs.

Additional general studies courses or similar courses which provide breadth and cultural background must be selected in consultation with the student's advisor. All students must complete EN 101, 102 First-year English, and a course in speech, unless waived, as a part of these 26 semester hours.

Physical Education activity courses may be included for no more than 3 semester hours of credit. Military Science and Aerospace Studies courses at the freshman and sophomore levels may be included. However, the sum of credits in these areas, together with Physical Education activity courses, may not exceed 6 semester hours.

Total general studies and other general courses . . . . . 57 sem. hrs.

**Business Administration Core Requirements.** In order to obtain an understanding of fundamentals of business operation and to develop a broad business background, every student seeking a Bachelor of Science degree in the College of Business Admin-

istration must complete the following courses:

	<i>Semester Hours</i>
AS 101 Elements of Business Enterprise . . . . .	3
AC 101 Elementary Accounting . . . . .	3
AC 102 Elementary Accounting . . . . .	3
QS 161 Quantitative Analysis and Statistics I . . . . .	3
QS 221 Quantitative Analysis and Statistics II . . . . .	3
AS 223 Business Communications . . . . .	3
MK 300 Principles of Marketing . . . . .	3
MG 301 Principles of Management . . . . .	3
AS 305 Business Law . . . . .	3
FI 300 Fundamentals of Finance . . . . .	3
MG 463 Business Policies . . . . .	3
Total . . . . .	33

### Field of Specialization Requirements

A field of specialization consists of a pattern of 24 semester hours in related courses falling primarily within a given subject field. Fields of specialization are available in accounting, advertising, economics, finance, general business administration, insurance, management, marketing, office administration, quantitative systems, and real estate.

**Accounting.** This field of specialization includes the essential academic training for: (1) those wishing to prepare themselves for professional careers in public accounting; (2) those seeking positions as controllers, heads of accounting divisions, cost accountants or internal auditors; (3) those wishing to serve in any of the numerous accounting positions offered in federal, state and local governments; and (4) those planning to operate their own businesses.

A field of specialization in accounting shall

consist of a minimum of 24 semester hours. The following 21 hours must be included:

AC 201 Intermediate Accounting . . . . .	3
AC 202 Intermediate Accounting . . . . .	3
AC 331 Cost Accounting . . . . .	3
AC 383 Advanced Accounting . . . . .	3
AC 451 Income Tax Accounting . . . . .	3
AC 481 Auditing Theory and Practice . . . . .	3
QS 302 Electronic Data Processing . . . . .	3

To complete the field of specialization, the student, with the approval of his advisor, shall select one additional 400-level accounting course.

*Note: All accounting majors must complete MA 142 Mathematical Analysis II, or the equivalent, as a part of the program. All accounting majors must take the AICPA Level II Achievement Examination in the regular semester nearest preceding their completion of degree requirements.*

**Advertising.** Use of the mass communications media for conveying ideas and information to customers, employees, stockholders and the general public is an essential part of modern business operation. This field of specialization offers students an opportunity to prepare for careers in advertising, public relations and related activities dealing with mass communications. Employment opportunities include positions with advertising agencies, retail stores, manufacturing firms, newspapers and broadcasting stations.

A field of specialization in advertising shall consist of a minimum of 24 semester hours. The following 15 hours must be included:

AD 301 Advertising Principles . . . . .	3
AD 311 Advertising Campaigns I . . . . .	3
AD 312 Advertising Campaigns II . . . . .	3
AD 371 Advertising Media . . . . .	3
AD 461 Advertising Management . . . . .	3

To complete the field of specialization, the student, in consultation with his advisor, shall select 9 hours or more from the following group:

- AD 453 Advertising Campaign Problems . 3
- MK 302 Marketing Environments . . . . . 3
- MK 304 Buyer Behavior . . . . . 3
- MK 310 Principles of Selling . . . . . 3
- MK 321 Principles of Retailing . . . . . 3
- MK 401 Public Relations in Business . . . . 3
- MK 451 Marketing Intelligence . . . . . 3

**Economics.** The study of economics affords an opportunity for the student to acquire a general knowledge of the operation of business and economic systems. This knowledge provides a sound basis for successful business ownership and control. Specialized courses are included to develop ability in the use of the tools of economic theory and analysis. Such tools are essential for graduates who wish to qualify for government or business positions requiring formal training in economics.

The field of specialization in economics shall consist of a minimum of 24 semester hours. The following six hours must be included:

- EC 401 Intermediate Price Analysis . . . . . 3
- EC 402 Economics of Income and Employment . . . . . 3

In addition, the student shall select a minimum of 18 semester hours from the group below to complete the field of specialization:

- EC 301 Money and Banking . . . . . 3
- EC 311 Economic Development . . . . . 3
- EC 321 Labor Economics . . . . . 3
- EC 331 Comparative Economic Systems . 3
- EC 336 International Economics . . . . . 3
- EC 341 Public Finance . . . . . 3

- EC 361 The Soviet Economy . . . . . 3
- EC 371 Latin American Economics . . . . . 3
- EC 408 Mathematical Economics . . . . . 3
- EC 412 Business Fluctuations and Forecasting . . . . . 3
- EC 421 State and Local Finance . . . . . 3
- EC 441 History of Economic Thought . . . 3
- EC 451 Economics of Public Utilities . . . 3
- EC 453 Government and Business . . . . . 3
- EC 461 Current Economic Problems . . . . 3
- GB 341 Transportation . . . . . 3
- QS 422 Advanced Business and Economic Statistics . . . . . 3

*Note: All undergraduate majors in economics are required to complete MA 142 Mathematical Analysis II, or the equivalent.*

**Finance.** Courses in finance provide students with an opportunity for increased understanding of the management problems of acquiring, allocating and managing funds within business firms, as well as introductions to the fields of investment management, financial institution management and the securities markets.

A field of specialization in Finance shall consist of a minimum of 24 semester hours of courses selected from the two groupings below. The following 15 hours shall be included:

- EC 301 Money and Banking . . . . . 3
- FI 421 Securities Investment . . . . . 3
- FI 426 Investment Management . . . . . 3
- FI 431 Financial Markets . . . . . 3
- FI 461 Financial Management Cases . . . 3

In addition, the student in consultation with his advisor shall select 9 hours or more from the group below:

- AC 201 Intermediate Accounting . . . . . 3
- AC 202 Intermediate Accounting . . . . . 3

- AC 301 Management Use of Accounting . . . . . 3
- AC 331 Cost Accounting . . . . . 3
- AC 415 Financial Statement Analysis . . . 3
- AC 432 Advanced Cost Accounting . . . 3
- AC 447 Accounting Information Systems . . . . . 3
- EC 336 International Economics . . . . . 3
- EC 341 Public Finance . . . . . 3
- EC 401 Intermediate Price Analysis . . . . 3
- EC 402 Economics of Income and Employment . . . . . 3
- QS 322 Managerial Statistics . . . . . 3
- QS 422 Advanced Business and Economic Statistics . . . . . 3
- QS 302 Electronic Data Processing . . . . 3
- QS 407 Systems Analysis . . . . . 3
- RE 331 Real Estate Finance . . . . . 3
- FI 305 Credit Management . . . . . 3
- FI 436 Financial Institution Management . . . . . 3
- FI 498 Pro-Seminar . . . . . 3
- MG 433 Managerial Decision-Making . . 3
- MG 459 International Management . . . . . 3

**General Business Administration.** Offering the opportunity for a broad survey of all phases of business operation, this program is particularly suitable for (1) those students who are planning to operate their own businesses and who seek a broad business background, (2) those who are preparing for jobs in large organizations with training programs in which specialization is taught after employment, and (3) those who desire a general business background at the undergraduate level prior to taking more specialized graduate work.

A minimum of 24 semester hours in economics and business administration is

required with a maximum of 9 hours in one subject field. Four senior-level courses must be included.

The 24 semester hours in economics and business administration may be selected from any 300 and 400 level courses, and, in addition, may include IN 251 Principles of Insurance, RE 251 Real Estate Principles, AC 201 and AC 202 Intermediate Accounting, with the limitation that no more than 6 hours of course work may be included at the 200 level.

General Business Administration students desiring to emphasize transportation should select 9 hours from the following:

GB 341 Transportation	3
GB 445 Physical Distribution Management	3
GB 460 Commercial Motor Transportation	3
GB 461 Air Transportation	3
GB 462 Problems in Transportation and Traffic	3
GB 463 International Transportation	3

To complete the field of specialization in General Business Administration with an emphasis on transportation, the student, in consultation with his advisor, should select 15 hours or more from the following:

EC 451 Economics of Public Utilities	3
EC 453 Government and Business	3
MG 355 Purchasing	3
MG 432 Materials Management	3
MK 302 Marketing Environments	3
MK 335 International Marketing	3
MK 434 Industrial Marketing	3

**Insurance.** Academic preparation for professional work in insurance sales, insurance adjustment and insurance management is offered through this program. A field of specialization in insurance shall consist of a

minimum of 24 semester hours. The following 15 hours must be included:

IN 251 Principles of Insurance	3
IN 321 Life and Health Insurance	3
IN 331 Property Insurance Principles and Coverages	3
IN 451 Social Insurance	3
IN 461 Estate Planning	3

To complete the field of specialization, select 9 or more hours from the following:

IN 425 Current Problems in Insurance	3
IN 432 Property Insurance Administration	3
EC 301 Money and Banking	3
AC 451 Income Tax Accounting	3
FI 421 Securities Investment	3
AS 306 Business Law	3
MK 310 Principles of Selling	3
MK 411 Sales Management	3
QS 302 Electronic Data Processing	3
QS 391 Operations Research	3
RE 251 Real Estate Principles	3

**Management.** The management function includes the planning, organizing, motivating and controlling of business operations. It deals with both human elements and material or physical factors. Through selection of courses, as outlined below, the student may place his major emphasis upon personnel management, production management or the broad aspects of management philosophy and practice. A field of specialization in management shall consist of a minimum of 24 semester hours. The following 18 hours must be included:

MG 311 Personnel Administration	3
MG 331 Production and Operations Management	3
MG 368 Management Systems	3

MG 433 Managerial Decision Making	3
MG 434 Management Responsibility in Society	3
MG 451 Human Relations in Business	3

The remainder of the required courses shall be selected by the student in consultation with his advisor as follows:

Those students planning careers in industrial relations or personnel management shall select at least 6 semester hours from:

MG 413 Wage and Salary Management	3
MG 423 Industrial Relations and Collective Bargaining	3
EC 321 Labor Economics	3
IN 451 Social Insurance	3

Those students planning careers in industrial and production management shall select at least 6 semester hours from:

MG 335 Methods Management	3
MG 355 Purchasing	3
MG 432 Materials Management	3
QS 391 Operations Research	3
AC 301 Management Uses of Accounting	3
AC 331 Cost Accounting	3

Those students seeking preparation in the broad aspects of management philosophy and practice shall select at least 6 semester hours from:

MG 422 Employee Training and Supervision	3
MG 423 Industrial Relations and Collective Bargaining	3
MG 459 International Management	3
QS 391 Operations Research	3
AC 301 Management Uses of Accounting	3
EC 453 Government and Business	3
MK 401 Public Relations in Business	3

**Marketing.** Study in the field of marketing involves analysis of the ways business firms

plan, organize, administer and control their resources to achieve marketing objectives. Focus is placed on market forces, growth and survival of firms in competitive markets, and the marketing strategy and tactics of the firm. Through proper selection of courses, a student may prepare for a career in (1) general marketing administration, (2) selling and sales management, (3) promotion management, (4) retail merchandising and management, (5) market research and planning, (6) industrial marketing, or (7) international marketing.

A field of specialization in marketing shall consist of a minimum of 24 semester hours. The following 15 hours must be included:

- MK 302 Marketing Environments . . . . . 3
- MK 304 Buyer Behavior . . . . . 3
- MK 412 Marketing Communications . . . . 3
- MK 451 Marketing Intelligence . . . . . 3
- MK 460 Marketing Decision-Making . . . . 3

To complete the field of specialization, the student, in consultation with his advisor, shall select 9 hours from courses offered or approved in advance by the Department of Marketing.

**Office Administration.** The course work in this field is designed to prepare students for either secretarial or office management positions. Through the selection of courses, as outlined below, the student may place his major emphasis upon either of these fields.

A field of specialization in office administration shall consist of a minimum of 24 semester hours. The following 15 hours must be included:

- OA 201 Advanced Typewriting . . . . . 3
- OA 344 Office Services . . . . . 3
- OA 351 Principles of Office Management. 3
- OA 432 Records Management. . . . . 3

- QS 302 Electronic Data Processing . . . . 3

To complete the field of specialization, the student, in consultation with his advisor, shall select the remainder of the 24-hour major requirement from the following courses:

For those planning careers in secretarial administration:

- OA 214 Shorthand . . . . . 3
- OA 312 Transcription . . . . . 3
- OA 331 Secretarial Administration . . . . 3
- AC 201 Intermediate Accounting . . . . . 3
- AS 431 Business Report Writing . . . . . 3
- MG 311 Personnel Administration . . . . . 3
- MK 401 Public Relations in Business. . . . 3
- SE 411 Business and Professional Speech 3

For those planning careers in office management:

- AC 201 Intermediate Accounting . . . . . 3
- AC 202 Intermediate Accounting . . . . . 3
- AS 431 Business Report Writing . . . . . 3
- MG 311 Personnel Administration . . . . . 3
- MG 422 Employee Training and Supervision . . . . . 3
- MG 451 Human Relations in Business . . . 3

**Real Estate.** Courses in real estate are designed to acquaint students with the basic information, knowledge and practices pertaining to real property and the real estate business. This field of specialization is the academic foundation for careers in various aspects of real estate work: sales, acquisition and development, taxation, management of property, title searching and legal work, appraisal, and finance.

A field of specialization in real estate shall consist of a minimum of 24 semester hours. The following 12 hours must be included:

- RE 251 Real Estate Principles . . . . . 3

- RE 302 Real Estate Management. . . . . 3
- RE 331 Real Estate Finance . . . . . 3
- RE 411 Real Estate Law . . . . . 3

To complete the field of specialization, the student, in consultation with his advisor, shall select 12 hours or more from the following:

- RE 401 Real Estate Appraisal . . . . . 3
- RE 441 Real Estate Land Development. 3
- RE 461 Real Estate Problems . . . . . 3
- AC 451 Income Tax Accounting . . . . . 3
- AD 301 Advertising Principles . . . . . 3
- FI 421 Securities Investment . . . . . 3
- AS 306 Business Law . . . . . 3
- IN 251 Principles of Insurance . . . . . 3
- MK 310 Principles of Selling . . . . . 3
- QS 302 Electronic Data Processing . . . . 3
- QS 391 Operations Research . . . . . 3

**Quantitative Systems.** This field of specialization prepares the student to approach the management of any of the business functions of production, marketing, and finance from a statistical and quantitative viewpoint. Though specific professional opportunities exist in applied statistics, operations research, and the management of information (data processing) systems, the program is oriented toward the overall managerial application of the systems and quantitative approach to any area of business operations.

A field of specialization in quantitative systems shall consist of a minimum of 24 semester hours. The following 18 hours must be included:

- QS 302 Electronic Data Processing . . . . 3
- QS 322 Managerial Statistics . . . . . 3
- QS 391 Operations Research . . . . . 3
- QS 402 Programming Systems . . . . . 3
- QS 407 Systems Analysis . . . . . 3

QS 422 Advanced Business and Economic Statistics .....	3
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To complete the field of specialization, the student, with the approval of his advisor, shall select a minimum of 6 semester hours from the group of courses below. It is recommended that these 6 hours be completed in one of the sequenced pair of courses in the same area, as identified below, so that the student can gain facility in applying the quantitative systems approach in a specific functional area.

AC 301 Managerial Accounting .....	3
AC 331 Cost Accounting .....	3
EC 408 Mathematical Economics .....	3
EC 412 Business Fluctuations and Forecasting .....	3
FI 421 Securities Investment .....	3
FI 461 Financial Management Cases ...	3
MG 331 Industrial Management .....	3
MG 432 Materials Management .....	3
MK 302 Marketing Environments .....	3
MK 451 Marketing Intelligence .....	3

*Note: All Quantitative Systems majors must complete MA 142 Mathematical Analysis II, or the equivalent, as part of the program.*

**Elective Courses.** Sufficient elective courses are to be selected by the student to complete the total of 126 semester hours required for graduation.

**Honors Program.** Students with outstanding academic records may be admitted to the Honors Program by application to the Honors Council of the College of Business Administration. This program provides an opportunity for students with exceptional ability to select an academic program to meet their individual needs. Although the general curriculum requirements must be completed,

considerable opportunity is given for independent study under the direction of an Honors advisor. A thesis or an equivalent creative project is required for graduation.

For further details regarding the Honors Program see the University Honors Program description on page 29 or consult the Office of the Dean of the College of Business Administration.

**Pass-Fail Courses.** Students majoring in Business Administration are not permitted to register for pass-fail in any course at this University. Students with majors in the College of Liberal Arts may register for pass-fail in courses offered by the Department of Economics, subject to conditions imposed by the College of Liberal Arts.

**General Regulations.** Each student enrolling in the College of Business Administration will be assigned an advisor upon the basis of the subject-matter field in which he is primarily interested. The student should follow the sequence of courses suggested in the four-year curriculum outline and the recommendations of his advisor in completing the prescribed background and tool courses in preparation for the subsequent professional program.

All students in the College of Business Administration must attain a minimum cumulative grade point index of 1.75 at the end of the freshman year.

**The Professional Program.** The third and fourth years constitute the professional program of the undergraduate curriculum. For admission to the professional program, the student must have completed:

(1) At least 60 semester hours with a minimum cumulative grade point index of 2.00;

(2) All Business Administration core cur-

riculum courses numbered below 300 and EC 201, 202, Principles of Economics, with a minimum cumulative grade point index of 2.00;

(3) At least 32 semester hours in general studies and other cultural background courses.

Failure to meet the requirements for admission to the professional program may result in the student's becoming ineligible to enroll for 300 and 400 level courses in the College of Business Administration.

To be accepted for credit as part of the professional program in Business Administration, all courses transferred from other institutions must carry prerequisites similar to those of the courses which they are replacing at Arizona State University.

**Graduation Requirements.** In addition to completion of the pattern of courses outlined on pages 121-122, to be eligible for the Bachelor of Science degree in the College of Business Administration, a student must fulfill the following requirements:

(1) Have completed at least 30 semester hours, including 24 in professional business courses (numbered 300 or above), after admission to the professional program.

(2) Have attained a cumulative grade point index of 2.00 or better:

(a) for all business courses taken at this University;

(b) for all courses included in the Business Administration core curriculum taken at this University;

(c) for all courses comprising his field of specialization taken at this University.

(3) Have accumulated a minimum of 51 semester hours in courses designed primarily for junior or senior students and completed

in an accredited, four-year degree-granting institution.

Any exceptions to the core curriculum and field of specialization requirements of the College of Business Administration must be approved by the Standards Committee.

**Transfer Credit.** Students planning to take their first two years of work at a junior college or at another four-year college should take only those courses in business that are offered as freshman or sophomore level courses at any of the three state-supported Arizona universities. Full lower division transfer credit is granted for all courses equivalent to those specified for the freshman and sophomore years at any one of the Arizona universities. These lower division courses are numbered 100 through 299 at Arizona State University and at Northern Arizona University and 1 through 99 at the University of Arizona.

Professional business courses taught in the junior and senior years in the three Arizona universities may not be completed for transfer credit at any community college. Courses taught as terminal, vocational or career classes at community colleges, even though similar to professional courses offered at the junior and senior levels at the three Arizona universities, will not be accepted for credit toward a bachelor's degree. A one-semester course in business law will be accepted as an exception to this policy.

A maximum of 30 semester hours of business and economics courses from community colleges will be accepted toward a bachelor's degree in business administration.

The following general pattern of courses is recommended for students completing their first two years' work in a junior college who plan to transfer to one of Arizona's universities without loss of credit:

Pre-professional Courses . . . . .	24 Hours
Accounting . . . . .	6
Economics . . . . .	6
Statistics . . . . .	3
Lower-Division Business Courses . . . . .	9
General Education . . . . .	39-40 Hours
English . . . . .	
Mathematics . . . . .	
Science . . . . .	
Humanities . . . . .	
Physical Education . . . . .	
Social Sciences . . . . .	

**Suggested Four-Year Curriculum Outline.**

**FIRST YEAR**

	<i>Semester Hours</i>
AS 101 . . . . .	3
QS 161 . . . . .	3
EN 101, 102 . . . . .	6
MA 141 (or other approved mathematics course) . . . . .	4
Humanities, Fine Arts . . . . .	3
Behavioral and Social Sciences . . . . .	6
Science or additional Mathematics . . . . .	3-5
Electives . . . . .	3-5
	31-35

**SECOND YEAR**

AC 101, 102 . . . . .	6
EC 201, 202 . . . . .	6
QS 221 . . . . .	3
AS 233 . . . . .	3
SE 100 or 300 . . . . .	3
Science and Mathematics . . . . .	3
General Studies . . . . .	8
	32

**THIRD YEAR**

MK 300 . . . . .	3
MG 301 . . . . .	3
AS 305 . . . . .	3
FI 300 . . . . .	3
Behavioral and Social Sciences . . . . .	6
Field of Specialization and Electives . . . . .	14
	32

**FOURTH YEAR**

MG 463 . . . . .	3
Field of Specialization and Electives . . . . .	28
	31

*Note: Students registering in the accounting field of specialization should enroll in AC 101 and AC 102 the first year, postponing science or electives until later in the program. In some other fields of specialization, students should schedule beginning courses in their field during the sophomore year, postponing one of the general studies courses until later. The student should consult his advisor for details of the course sequence in the field of specialization.*

**Pre-Law Curriculum.** Pre-law students may pursue a program of study in the College of Business Administration as well as in the College of Liberal Arts. Courses in accounting, economics, finance, insurance, labor relations and statistics are recommended for any student planning to enter the legal profession.

The admission requirements of colleges of law differ considerably. The student should communicate with the dean of the law school he hopes to attend and plan his program to meet the requirements of that school. Most law schools, including Arizona State University, require a baccalaureate degree for admission, although some permit admission

upon completion of three years of college work.

Students who plan to take a bachelor's degree prior to entering law school may follow any of the standard curricula in the College of Business Administration. Many pre-law students find it desirable to major in General Business Administration. This gives the student a broad background for the study of law. Within the College of Business Administration are faculty members who are lawyers. These faculty members will be advisors for students desiring a pre-law general business administration major.

**Business, Office and Distributive Education Curriculum.** Course work in this area is designed for students who wish to teach business, office or distributive subjects in secondary schools. Through the selection of

courses, as outlined below, the student may place his major emphasis upon any of these fields.

A major must include:

*The entire Business Administration core*

- EC 201, 202 Principles of Economics
- OA 201 Advanced Typewriting
- OA 344 Office Services
- OA 351 Office Management

To complete an extended teaching major, the student in consultation with his advisor may select options from:

- Accounting
- Business Education
- General Business Administration
- Marketing
- Office Administration
- Quantitative Systems

A teaching minor in business, office and distributive subjects consists of 24 semester hours of credit in business. OA 201 is required. The remaining courses to complete the minor must be selected in consultation with a minor advisor.

The Department of Administrative Services participates in programs leading to the degrees of Master of Arts in Education and Doctor of Education. Consult the Graduate Catalog for requirements.

**Bilingual Secretarial Program.** (French, German, Russian, Spanish). This degree program is offered jointly by the Department of Foreign Languages and the Department of Administrative Services. Students interested in this program should consult the chairman, Department of Foreign Languages.

Business Administration Building



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## Accounting

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**Professors:**

BURTON, HUIZINGH

**Associate Professors:**HELMKAMP (BA 223A), HUNTINGTON,  
IMDIEKE, KRUEGER, NIELSEN, SANDERS,  
WILKINSON**Assistant Professors:**

HARIED, MCKENZIE, ROWLEY, R. SMITH

**AC 101 Elementary Accounting.** Theory and practice of accounting applicable to the accumulation, external reporting and external uses of financial accounting information. Three lectures, 1 hour laboratory. Credit, 3 hours.

**102 Elementary Accounting.** Selection and analysis of accounting information for internal use by management. Prerequisite: AC 101. Three lectures, 1 hour laboratory. Credit, 3 hours.

**201 Intermediate Accounting.** Accounting theory and practice applicable to current assets, fixed assets, liabilities and sources and applications of funds. Prerequisite: AC 102. Credit, 3 hours.

**202 Intermediate Accounting.** Accounting theory and practice applicable to corporate net worth accounts, investments, reserves and income. Prerequisite: AC 201. Credit, 3 hours.

**300 Survey of Accounting.** Introduction to financial and managerial accounting with emphasis on the uses of accounting information. Not open to students in the College of Business Administration. Credit, 3 hours.

**301 Management Uses of Accounting.** Development and analysis of accounting information relevant to managerial decisions, budgeting and control. Designed primarily for non-accounting majors. Prerequisite: AC 102. Credit, 3 hours.

**331 Cost Accounting.** Cost accumulation for inventory pricing and income determination. Cost behavior concepts for planning and control. Job order and process cost systems, standard costs and budgeting. Prerequisite: AC 102. Credit, 3 hours.

**383 Advanced Accounting.** Accounting theory applicable to partnerships, branches, business combinations and governmental units. Prerequisite: AC 202. Credit, 3 hours.

**415 Financial Statement Analysis.** Analytical methods applied to financial statements for the guidance of management and investors. Designed primarily for nonaccounting majors. Prerequisite: AC 102. Credit, 3 hours.

**432 Advanced Cost Accounting.** Special topics in relevant costs for decision-making, planning and control, including capital budgeting and applications of operations research and statistics. Prerequisite: AC 331. Credit, 3 hours.

**447 Accounting Information Systems.** Information systems requirements and data sources relative to the total integrated system of the firm, with emphasis on system analysis and design, internal controls and computer processing. Prerequisite: AC 301 or 331 or 501. Credit, 3 hours.

**451 Income Tax Accounting.** Concept of taxable income; tax accounting problems of individuals, partnerships and corporate entities. Prerequisite: AC 102. Credit, 3 hours.

**452 Income, Estate and Gift Taxation.** Complex problems of income taxation; estate, trust fiduciary and gift taxes; tax planning. Emphasis on tax research. Prerequisite: AC 451. Credit, 3 hours.

**472 Consolidations and Mergers.** Theory and practice applicable to the consolidation of parent and subsidiary financial statements and the merging of corporate interests. Prerequisite: AC 383. Credit, 3 hours.

**481 Auditing Theory and Practice:** Auditing standards, procedures, programs and working papers; internal control; ethical and legal responsibilities of the Certified Public

Accountant. Prerequisite: AC 383. Credit, 3 hours.

**500 Accounting Survey and Analysis.** Basic accounting concepts and procedures. The determination of periodic income. Preparation and interpretation of financial statements. Open only to students without previous credit in accounting. Credit, 3 hours.

**501 Managerial Accounting.** Use of accounting data in the managerial decision-making process and in the analysis and control of business operations. Prerequisite: AC 500 or equivalent. Credit, 3 hours.

**505 Law in Professional Accounting.** Law applicable to the various forms of business organizations and the transactions conducted by these business entities. Credit, 3 hours.

**509 Governmental and Institutional Accounting.** Accounting methods and procedures applicable to federal, state and municipal governmental units, and religious, charitable and nonprofit organizations. Prerequisite: AC 102. Credit, 3 hours.

**521 Tax Problems.** Income, estate and gift tax problems arising in the planning and review of business and investment transactions. Prerequisite: AC 451. Credit, 3 hours.

**522 Tax Practice Management.** Economics of tax practice management and methodology of tax research, including a survey of conference and court procedures. Prerequisite: AC 451. Credit, 3 hours.

**541 Accounting Controls.** Design, implementation and evaluation of accounting control systems, including behavioral and quantitative aspects. Prerequisite: AC 331 or 501. Credit, 3 hours.

**551 Advanced Accounting Theory.** Critical analysis of generally accepted accounting theories and principles. Credit, 3 hours.

**552 Problems in Income Determination.** Analysis of problems in the calculation and disclosure of the periodic income of business enterprises. Credit, 3 hours.

**582 Auditing Theory and Practice.** Interrelation of audit concepts, standards, techniques and procedures. Sampling techniques in auditing, auditing EDP systems and contemporary issues in auditing practice. Prerequisite: AC 481. Credit, 3 hours.

**585 Problems in Managerial Accounting.** Application of accounting analysis and quantitative techniques in the solution of problems concerning internal planning and control. Credit, 3 hours.

**586 Problems in Financial Accounting.** Analysis of problems in controversial areas. External reporting requirements for selected industries. Influence of government regulation. Credit, 3 hours.

**587 Computerized Accounting Systems.** Design, installation, and evaluation of computer-based accounting information systems. Models that use accounting data and quantitative techniques to aid in analysis, planning and control. Prerequisites: AC 447 and 585 and a knowledge of computer programming. Credit, 3 hours.

**591 Seminar in Selected Accounting Topics.** Credit, 3 hours.

**691 Doctoral Core Seminar in Accounting.** Credit, 3 hours.

**791 Doctoral Seminar in Accounting.** Credit, 3 hours.

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## Administrative Services

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**Professors:**

BOGGS (BA 352B), BATY, TATE

**Associate Professors:**

BOHLMAN, GRYDER, JACKS, ROWE,  
A. SMITH, C. SMITH, TOOTLE

**Assistant Professors:**

FAHLGREN, FRAME, MERKEL,  
NEUHEISEL, OLNEY, POWELL, SNYDER,  
WILSON

**AS 101 Elements of Business Enterprise.**

Organization, functions, activities and role of business in the American economic system. Orientation to business terminology, practices, problems and career opportunities. Not open to students who have received credit in EC 202 and MG 301. Credit, 3 hours.

**233 Business Communication.** Development of psychologically sound business communications in correct and forceful English. All outside assignments must be in typewritten form. Prerequisite: EN 102. Credit, 3 hours.

**305 Business Law.** The law as it applies to business. History of legal development and judicial procedures. Contracts, their operations and discharge, and the law of agency and partnership. Credit, 3 hours.

**306 Business Law.** Legal aspects of corporations, sales, negotiable instruments, property, secured transactions, bankruptcy and insurance. Prerequisite: AS 305. Credit, 3 hours.

**307 Business and the Legal Environment.** Statutory laws versus judge-made laws. Legal aspects of governmental regulation of commerce and competition and legal problems affecting business in the modern world. Credit, 3 hours.

**431 Business Report Writing.** Organization and preparation of reports of the types used in business. Techniques of collecting, interpreting and presenting information useful to management. Prerequisite: AS 233. Credit, 3 hours.

**451 Business Research Methods.** Nature and purpose of research. Problem of acquiring knowledge. Validation and minimization of error. Definition of meaningful questions. Relevant data. Prerequisite: QS 221. Credit, 3 hours.

**500 Business Research Methods.** Credit, 3 hours.

## BUSINESS EDUCATION

**BE 401 Vocational Education in American Schools.** Basic principles and philosophies of

vocational education. Relationship of vocational education to general education, history and legislation. Credit, 3 hours.

**480 Methods of Teaching Business Subjects.** Methods of instruction, organization and presentation of appropriate content in type-writing, shorthand, bookkeeping, business machines and basic business courses. Prerequisite: SE 311 or concurrent registration. Credit, 3 hours.

**481 Methods of Teaching Basic Business and Economics.** Methods of instruction, organization and presentation of the subject matter of basic business, economic education and closely allied fields. Credit, 3 hours.

**490 Methods of Teaching Distributive Education.** Instruction, organization and content for distributive education in high schools and in junior colleges. Credit, 3 hours.

**491 Organization and Management of Cooperative Programs.** Work-study programs for business occupations in high schools and junior colleges. Developing and coordinating such programs. Instructional materials. Credit, 3 hours.

**501 Foundations of Business Education.** History, philosophy, principles and objectives of business education. Problems of curriculum and curriculum evaluation. Contribution of business education to general education. Registration subject to approval of instructor. Credit, 3 hours.

**502 Administration and Supervision of Business Education.** Departmental and classroom problems related to curriculums, equipment, guidance, in-service training and personnel. Regulation of vocational business education programs by state and federal agencies. Credit, 3 hours.

**503 Tests and Measurements in Business Education.** Constructing, administering and evaluating tests in secretarial and general business subjects. Diagnostic testing for remedial teaching in these subjects. Credit, 3 hours.

**504 Guidance for Business and Distributive Education.** Occupational surveys and job analysis to determine community opportunities and requirements for employment. Placement, follow-up and counseling for problems encountered by student workers. Legislation affecting business occupations. Credit, 3 hours.

**511 Improving Instruction in Secretarial Subjects.** Modern methodology in teaching typewriting, shorthand and office practice courses. Psychology of skill building and techniques of office production. Credit, 3 hours.

**513 Improving Instruction in Bookkeeping and General Business Subjects.** Evaluation of methodology and materials used in teaching bookkeeping, general business and related subjects. Place of basic business education in general education. Credit, 3 hours.

**515 Observation and Work Experience.** Observation and/or participation in business. Seminars based on the observation and/or participations. Credit, 3 hours.

**521 Education for Business in the Junior College.** Curriculum and instruction for vocational and general business subjects. Articulation with secondary schools and collegiate institutions. Credit, 3 hours.

**591 Seminar.** Credit 2 or 3 hours. Topics such as the following will be offered:

- (a) Office Practice and Machines
- (b) Current Literature
- (c) Data Processing for Teachers
- (d) Analysis of Research in Business Education
- (e) Organization and Management of Adult Programs
- (f) Individualized Instruction
- (g) Consumer Education

**594 Study Conference or Workshop.** Conducted by outstanding leaders. Individual conferences, reports, group work and work on individual problems. Credit, 1 to 6 hours.

**791 Doctoral Seminar in Business Education.** Credit, 3 hours. See page 47 for listing of special graduate courses available.

### OFFICE ADMINISTRATION

**OA 101 Basic Typewriting.** Mastery of the keyboard. Development of speed and accuracy. Tabulation, centering and business letters. One lecture, 2 hours laboratory. Credit, 2 hours.

**113 Shorthand.** Basic principles of reading and writing shorthand. Dictation of practiced material. Two lectures, 2 hours laboratory. Credit, 3 hours.

**201 Advanced Typewriting.** Proficiency in production of office problem material. Prerequisite: OA 101. Two lectures, 2 hours laboratory. Credit, 3 hours.

**214 Shorthand.** Building dictation speed with unpracticed material, and a review of shorthand principles. Prerequisite: OA 113. Two lectures, 2 hours laboratory. Credit, 3 hours.

**312 Transcription.** Increased speed in sustained dictation and the transcription of mailable business correspondence. Prerequisite: OA 214. Two lectures, 2 hours laboratory. Credit, 3 hours.

**331 Secretarial Administration.** Role of the professional secretary in facilitating managerial functions. Demonstration of basic secretarial competencies required for credit in this course. Credit, 3 hours.

**344 Office Services.** Voice-writing, duplicating, copying and calculating machines. Alphabetic filing. Proportional spacing typewriters. Services as related to office systems. Prerequisite: OA 201. Two lectures, 1 hour laboratory. Credit, 3 hours.

**351 Principles of Office Management.** Relationship of the office function to the business enterprise including office location and layout, selection of office equipment and supplies, principles of office organization, supervision of office personnel, employee training programs, office services and control

of office output. Credit, 3 hours.

**432 Records Management.** Organization and management of records systems. Credit, 3 hours.

**501 Office Systems and Procedures.** Methods of establishing, analyzing, standardizing, and controlling administrative systems and procedures including: work simplification, forms analysis, work-flow charting, layout and space analysis, office manuals. Prerequisite: OA 351. Credit, 3 hours.

**502 Advanced Office Management.** Analytical and philosophical approach to the office, the administrative manager and office services. Cases, problems and discussions. Credit, 3 hours. See page 47 for listing of special graduate courses available.

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## Economics

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### Professors:

TAYLOR (BA 323E), FARRIS, J. COCHRAN, PLANTZ

### Associate Professors:

KNOX, LARSON, LOWE, SHAPIRO

### Assistant Professors:

BOND, BURGESS, COX, DICKENS, GOODING, HOGAN, JACKSON, KINGSTON, LADMAN, LOFGREEN, SHELTON, WINKELMAN

**EC 100 Development of the American Economic System.** Analytical treatment of the evolution of the American economy. Introduction to economic institutions in the United States. Credit, 3 hours.

**201 Principles of Economics.** Descriptive analysis of the structure and functioning of the American economy. Emphasizes basic economic institutions and the factors determining income and employment levels. Credit, 3 hours.

**202 Principles of Economics.** Price determination and income distribution in a capitalistic

economy. Current economic issues with emphasis on labor-management relations, agriculture, international trade and government regulation of business. Prerequisite: EC 201. Credit, 3 hours.

**301 Money and Banking.** Functions of money, monetary systems, credit functions, banking practices and policies. Prerequisite: EC 202. Credit, 3 hours.

**303 Economic Analysis and Public Policy.** Application of analytical methods to economic aspects of national and international policy problems. Critical evaluation of conflicting theories and proposals. Prerequisite: EC 202. Credit, 3 hours.

**311 Economic Development.** Theories of economic growth and development. Role of capital formation, technological innovation, population and resource development in economic growth. Prerequisite: EC 202. Credit, 3 hours.

**321 Labor Economics.** Historical and theoretical analysis of labor problems and labor relations. Labor force wage theories and practices. Employment and unemployment. Government regulations. Prerequisite: EC 202. Credit, 3 hours.

**322 Economics of Human Resources.** Theory and measurement of human capital. Manpower policy for education, training and job matching, in the context of efficient market allocation. Prerequisite: EC 202. Credit, 3 hours.

**331 Comparative Economic Systems.** Economic theories and practices of capitalism, socialism, communism and fascism. Prerequisite: EC 201. Credit, 3 hours.

**336 International Economics.** Principles of the comparative-advantage doctrine, including practices under varying commercial policy approaches. The economic impact of international disequilibrium. Prerequisite: EC 202. Credit, 3 hours.

**341 Public Finance.** Principles and practices of taxation, public expenditures, budget formulation, debt management and fiscal

policy with emphasis on federal government finance. Prerequisite: EC 202. Credit, 3 hours.

**361 The Soviet Economy.** Soviet economic development. Evaluation of Soviet statistics and accounting. Organization and management, planning techniques, distribution, finance, labor, agriculture and transportation. Prerequisite: EC 202 or 331. Credit, 3 hours.

**371 Latin American Economics.** Economic practices of Latin American economies with emphasis on special problems of economic development in the major Latin American countries. Prerequisite: EC 202. Credit, 3 hours.

**401 Intermediate Price Analysis.** Value and distribution theory. Price and output decisions of business firms under conditions of competition, monopolistic competition, oligopoly and monopoly. Prerequisite: EC 202. Credit, 3 hours.

**402 Economics of Income and Employment.** Analysis of determinants of aggregate levels of employment, output and income of an economy. Prerequisite: EC 202. Credit, 3 hours.

**408 Mathematical Economics.** Integration of economic analysis, mathematical methods, and quantitative procedures into a comprehensive body of knowledge within contemporary economic theory. Prerequisite: EC 202. Credit, 3 hours.

**412 Business Fluctuations and Forecasting.** Comparisons of leading business cycle theories. Identification, measurement and analysis of economic fluctuations. Methods of forecasting. Prerequisite: QS 221. Credit, 3 hours.

**421 State and Local Finance.** Principles and practices of financing state and local governments with emphasis on budgeting, factors affecting expenditures, tax structures and fiscal capacity, and intergovernmental financial relations. Prerequisite: EC 202. Credit, 3 hours.

**441 History of Economic Thought.**

Development of economic doctrines, theories of mercantilism, physiocracy, classicism, neoclassicism, Marxism and contemporary economics. Prerequisite: 12 hours of economics or approval of instructor. Credit, 3 hours.

**451 Economics of Public Utilities.** Economic, legislative and administrative problems in the regulation of public utility rates and service standards. Public utility costs, pricing policies, rates, plant utilization, competition. Prerequisite: EC 202. Credit, 3 hours.

**453 Government and Business.** Development of public policies toward business. Antitrust activity. Economic effects of government policies. Prerequisite: EC 202. Credit, 3 hours.

**461 Current Economic Problems.** Discussion of current economic issues. Oral and written reports on assigned topics. Prerequisite: 12 hours of economics or approval of instructor. Credit, 3 hours.

**481 Methods of Teaching Basic Business and Economics.** Methods of instruction, organization and presentation of the subject matter of basic business, economic education and closely allied fields. Credit, 3 hours.

**500 Business Economics.** Fundamentals of micro- and macro-economic analysis. Price and output determination in various market structures. Functional distribution of income. Theory of income and employment. Open only to students without previous credit in economics. Credit, 3 hours.

**501 Managerial Economics.** Management problems from an economic point of view. Includes the application of economic analysis to decision-making in various areas of business policy development. Credit, 3 hours.

**503 International Economic Theory.** Economic theory as it applies to international trade, the balance of payments, economic integration, factor movements, international imbalances and international trade policies of the developed and less-developed countries. Credit, 3 hours.

**504 Fiscal Policy.** Fiscal theory and its appropriate role in determining the economic policies of government. Credit, 3 hours.

**505 Monetary Policy.** Determinants of the money supply and the level of interest rates. Federal Reserve policy and the effectiveness of central banking policy. Credit, 3 hours.

**511 Macroeconomic Analysis.** Analysis of the nation's income, output, employment and general price level. Examination of current theoretical and empirical research and policy problems. Credit, 3 hours.

**512 Microeconomic Analysis.** Theory of firm, industry and market structure emphasizing demand, cost, price and profit within the framework of a modified private enterprise system. Credit, 3 hours.

**521 Manpower Economics.** Analysis of variables affecting manpower resources. Availability and behavior of labor supply under changing economic conditions. Credit, 3 hours.

**531 Economic Systems and Organizations.** Analysis of philosophical foundations of major economic systems and of properties of principal system models. Comparison of alternative institutions and system components of contemporary economies. Credit, 3 hours.

**537 American Economic Growth.** Analysis of the growth of the American economy within the framework of economic theory. Development and interactions of institutions and technology to meet the changing needs of the economy. Credit, 3 hours.

**553 Industrial Organization and Public Policy.** Application of market theory to contemporary industrial organization, emphasizing oligopoly. Structure, conduct and performance in industrial markets. Recent developments in antitrust policies. Credit, 3 hours.

**570 Economics of Developing Nations.** Analysis of economic problems, issues and policy decisions facing the lesser developed nations of the world. Prerequisites: EC 401

and 402, or approval of instructor. Credit, 3 hours.

**580 Econometrics.** Application of mathematical and statistical techniques to problems of economic theory, emphasizing application of multiple regression analysis to time-series and cross-sectional data. Principles, rather than computational methods or mathematical rigor, are stressed. Prerequisites: MA 142 and QS 422, or equivalent. Credit, 3 hours.

**591 Seminar in Selected Economics Topics.** Credit, 3 hours.

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## General Business Administration

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### Professors:

DAUTEN (BA 267A), OVERMAN,  
STEVENSON

### Associate Professors:

ANDERSON, BECKER, D. COCHRAN, DANIEL,  
TUBEROSE, WILT

### Assistant Professors:

APILADO, HAGAN, HEATHCOTTE, MYLER,  
TENNEY

## FINANCE

**FI 300 Fundamentals of Finance.** Management capital budgeting problems of acquiring, allocating and managing funds within the business enterprise. Serves as introduction for further study of the capital markets and financial institution and of securities investments. Prerequisites: AC 102, EC 202. Credit, 3 hours.

**305 Credit Management.** Principles and current practices in the field of commercial credit. Evaluation and use of credit reports, analysis of credit risks; credit limits and control. Prerequisite: FI 300. Credit, 3 hours.

**403 Personal Finance.** Financial problems and

institutions affecting individuals: borrowing, saving, insurance, investment, financial agencies. Not open to students in the College of Business Administration. Credit, 3 hours.

**421 Securities Investment.** The environment and process of securities investment, and the appraisal of security value. Prerequisite: FI 300. Credit, 3 hours.

**426 Investment Management.** Principles of portfolio management. Investment selection and timing techniques. Prerequisite: FI 421 or permission of instructor. Credit, 3 hours.

**431 Financial Markets.** Analysis of the major financial markets and their interrelationships through interest rates and prices. Flow of funds and price behavior of the market as a whole; specific types of trading on over-the-counter and national exchanges. Prerequisites: FI 300, EC 301. Credit, 3 hours.

**436 Financial Institution Management.** Management problems encountered in savings institutions, commercial banks, credit and mortgage institutions. Industry problems, regulations, credit appraisal and loan types. Presentations by industry representatives, cases and lectures. Prerequisites: FI 300, EC 301. Credit, 3 hours.

**461 Financial Management Cases.** Financial management problems of business firms studied through case materials and readings. Emphasizes capital budgeting, cost of capital, short- and long-term funds, valuation situations. Prerequisite: FI 300. Credit, 3 hours.

**498 Pro-Seminar.** Advanced treatment of one of the three areas of finance: (a) financial management; (b) capital markets and institutions; (c) investments; particularly through student projects and through review of the literature. Prerequisites: FI 300, approval of instructor. Credit, 3 hours.

**500 Finance Fundamentals.** Acquisition, allocation and management of funds within the business enterprise. Financial goals, fund flows, capital budgeting, financing strategies. Open only to students without previous

credit in finance. Prerequisite: AC 102 or 500 or equivalent. Credit, 3 hours.

**521 Securities Price Behavior.** Movements in securities prices with emphasis on common stock prices. Analysis of selected investment techniques. Prerequisite: FI 421 or equivalent. Not open to students who have had FI 426 or equivalent. Credit, 3 hours.

**526 Portfolio Management.** Theory and techniques of portfolio valuation and management. Prerequisite: FI 421 or equivalent. Not open to students who have had FI 426 or equivalent. Credit, 3 hours.

**531 Capital Markets and Institutions.** Factors affecting interest rates and prices in the money and capital markets, fund flows in the new issue and secondary markets. Prerequisite: FI 300 or 500. Credit, 3 hours.

**561 Financial Management.** Financial management decision-making situations studied through case materials and readings. Emphasis on capital budgeting, fund-raising and financing strategies. Prerequisite: FI 300 or 500. Credit, 3 hours.

**571 Problems in Finance.** Advanced treatment of one of the three areas of finance (financial management, capital markets and institutions, investments), particularly through student projects and through review of the literature. Prerequisites: FI 300 or 500 and one other graduate Finance course. Credit, 3 hours.

**591 Seminar in Selected Finance Topics.** Credit, 3 hours.

**691 Doctoral Core Seminar in Finance.** Credit, 3 hours.

**791 Doctoral Seminar in Finance.** Credit, 3 hours.

#### **GENERAL BUSINESS ADMINISTRATION**

**GB 331 International Business.** Multi-disciplinary analysis of ideologies, cultures, politics, economics, social values and institutions as they relate to operations of the international firm. Prerequisite: EC 202 or approval of instructor. Credit, 3 hours.

**341 Transportation.** Analysis of economic principles and legislative practices in the regulation of rates and services of rail, motor, air and pipeline transportation. Theory of rates, discrimination, reasonableness, economic costs and public policy toward transportation agencies. Prerequisite: EC 202. Credit, 3 hours.

**371 Principles of Hotel Administration.** Development and organization of the hospitality industry. Survey and evaluation of hotel and motel services. Responsibilities and procedures of the departments of food, maintenance, engineering and the front office. Career opportunities in hotel administration. Credit, 2 hours.

**445 Physical Distribution Management.** Management of the physical distribution function of the business enterprise. Prerequisite: GB 341. Credit, 3 hours.

**460 Commercial Motor Transportation.** Highway systems of the U.S., motor carrier operations and regulations of motor transportation. Costs, rates, services, taxes, weights and sizes, coordination and consolidation. Relationships with competitive modes of transportation. Prerequisite: GB 341. Credit, 3 hours.

**461 Air Transportation.** Economic and business aspects of commercial air transportation. Economics of the airline industry, rate-making, government control and assistance to airline operations. Routes and services, equipment and operations, interrelationships with competing modes of transportation. Prerequisite: GB 341. Credit, 3 hours.

**462 Problems in Transportation and Traffic.** Case problems in transportation operations and traffic management of transportation firms. Selection of equipment, pricing, control, finance, labor relations, organization and location of transportation operations. Prerequisite: GB 341. Credit, 3 hours.

**463 International Transportation.** Analysis of the movement of goods between foreign

countries in international business; routes, rates, costs, operation, administration and regulation of international air and maritime transportation agencies. Prerequisite: GB 341. Credit, 3 hours.

**541 National Transportation Policy.** Public policy alternatives and problems in the transportation industry; interrelationships of competing transportation modes; relationships of public investment to private operation. Credit, 3 hours.

**591 Seminar (Business Policy).** Integration of the various functional and other policy areas of the firm. Emphasis on case studies. (Last semester of MBA course work). Credit, 3 hours.

#### **INSURANCE**

**IN 251 Principles of Insurance.** Coverages available, buying methods, procedures in settling claims, insurance companies and vocational opportunities. Prerequisite: AS 101. Credit, 3 hours.

**321 Life and Health Insurance.** Fundamentals of life insurance including types of contracts, functions of various contracts, company organization, rate making, selection of risks and other home office operations. Governmental supervision of life insurance companies. Prerequisite: IN 251. Credit, 3 hours.

**331 Property Insurance Principles and Coverage.** Policies and principles of fire and casualty insurance. For students planning to make careers in agency or home office work as well as those needing a fundamental knowledge of insurance for business. Prerequisite: IN 251. Credit, 3 hours.

**425 Current Problems in Insurance.** Analysis of major problems and issues in the insurance industry. Prerequisite: Nine hours of insurance. Credit, 3 hours.

**432 Property Insurance Administration.** Rate-making, reserves, financial statements, investments, underwriting, claims, prevention and surveys. For students planning careers in agency or home office work. Prerequisite: IN 331. Credit, 3 hours.

**451 Social Insurance.** Insurance coverages provided by state and federal governments: social security, unemployment insurance, workmen's compensation and other social or governmental insurance plans. Credit, 3 hours.

**461 Estate Planning.** Integration of life insurance with wills, trusts and business buy-sell agreements. Application of the needs approach to estate planning. Credit, 3 hours.

**591 Seminar.** (Selected insurance topics). Credit, 3 hours.

### REAL ESTATE

**RE 251 Real Estate Principles.** Regulations, practices, legal aspects and professional ethics of the real estate business. Prerequisite: EC 202. Credit, 3 hours.

**302 Real Estate Management.** Management of residences, apartments and commercial properties. Consideration of professional standards, methods of business promotion, leasing, insuring and maintaining properties as an agent of the owners. Prerequisite: RE 251. Credit, 3 hours.

**331 Real Estate Finance.** Sources and availability of funds. Management, servicing and repayment of loans. Prerequisite: RE 251. Credit, 3 hours.

**401 Real Estate Appraisal.** Factors affecting the value of real estate. Theory and practice of appraising and preparation of the appraisal report. Techniques in appraisals. Prerequisite: RE 251. Credit, 3 hours.

**411 Real Estate Law.** Legal practices as they apply to the real estate field in general and to the fields of titles, mortgages, lending and trust work. Prerequisite: RE 251. Credit, 3 hours.

**441 Real Estate Land Development.** Neighborhood and city growth. Municipal planning and zoning. Development of subdivisions. Agricultural land utilization. Prerequisite: RE 251. Credit, 3 hours.

**461 Current Real Estate Problems.** Recent

developments in the fields of real estate, finance, taxation, zoning, planning, governmental regulations and government assistance programs. Prerequisite: RE 251. Credit, 3 hours.

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## Management

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### Professors:

FEARON (BA 367E), DAVIS, SCHABACKER

### Associate Professors:

HEIER, INSKEEP, MENDLESON, REIF,  
REUTER, TINGEY, WHITE, WRIGHT

### Assistant Professors:

BASSFORD, MONCZKA, NEWSTROM, RUCH

**MG 301 Principles of Management.** Fundamentals of organization and administration. Planning, organizing, directing, coordinating and controlling business activity. Credit, 3 hours.

**311 Personnel Administration.** Personnel selection, placement, training, promotion, wage incentives, absenteeism and counseling. Prerequisite: MG 301. Credit, 3 hours.

**331 Production and Operations Management.** Principal functions, departmental activities and policies of manufacturing firms. Organization for production and analysis of production methods. Prerequisite: MG 301. Credit, 3 hours.

**335 Methods Management.** Role of management in methods improvement. Productivity concept as it relates to business efficiency. Development of employee attitude supporting productivity. Process charts. Methods improvement in the work environment. Class practice in methods analysis. Prerequisite: MG 301. Credit, 3 hours.

**355 Purchasing.** Practices and problems confronting the purchasing agent, including sources of supply, market information,

material specification and inspection, control records, inventories, stores, and purchase budgets. Prerequisites: MK 300, MG 301. Credit, 3 hours.

**368 Management Systems.** Systems theory and management functions; basic tools for systems analysis; organizational systems design; systems application in recent business practices; systems simulation. Prerequisite: MG 301. Credit, 3 hours.

**413 Wage and Salary Management.** Installation and administration of a complete wage and salary program, including objectives, policies, organization, control, job evaluation, wage surveys and winning acceptance for an integrated program. Prerequisite: MG 311. Credit, 3 hours.

**422 Employee Training and Supervision.** Principles of supervision, techniques of leadership, adjustment of grievances, policy interpretation, group attitude and morale, training and learning processes, and counseling techniques. Prerequisite: MG 311. Credit, 3 hours.

**423 Industrial Relations and Collective Bargaining.** Processes and procedures of collective bargaining. Scope and negotiation of union contracts. Prerequisite: EC 321. Credit, 3 hours.

**432 Materials Management.** Analysis and managerial integration of the material flow process within an organization, including materials research and standards, purchasing, production and inventory control, warehousing and materials movement. Prerequisite: MG 331. Credit, 3 hours.

**433 Managerial Decision-Making.** Role of probability and desirability in management decision-making. Decision theory and models. The decision process. Communication networks and input-outputs in decision-making. Class performance of business games. Prerequisite: MG 301. Credit, 3 hours.

**434 Management Responsibility in Society.** Developments arising from separation of ownership and management and the growth of

professional management. Limits of management authority. Relation of profit and service objectives to a business society. Prerequisite: MG 301. Credit, 3 hours.

**451 Human Relations in Business.** Human aspects of business, as distinguished from economic and technical aspects, and how they influence efficiency, morale and management practice. Prerequisite: MG 301. Credit, 3 hours.

**459 International Management.** Problems and policies for multinational corporations; planning international objectives and strategies; developing multinational structures and executives; adapting domestic policies to overseas environments. Comparative analysis of firms operating in various foreign countries. Prerequisite: MG 301. Credit, 3 hours.

**463 Business Policies.** Analysis of problems encountered by management in its daily operations. Investigation of sound business principles and practices. Integration of functional and other policy areas of the firm. Prerequisite: Completion of 90 hours, including all other Business Administration core requirements. Credit, 3 hours.

**501 Managerial Concepts.** Analysis of current administrative philosophy and practices, and their historical foundations. Integration of an organization from the point of view of an administrator. Prerequisite: MG 301. Credit, 3 hours.

**503 Organizational Behavior.** Development of effective work groups in business. Analysis of cases in organizational relationships. Group dynamics, effects of change and informal organization. Credit, 3 hours.

**520 Problems in Personnel Management.** Selecting, developing, maintaining and utilizing a competent labor force. Case studies of personnel problems. Preparation of a written personnel program. Credit, 3 hours.

**522 Labor Relations and Public Policy.** Development of state and federal legislation. Analysis of recent decisions of courts and labor boards. The legal rights and duties of

employers, unions and the public. Credit, 3 hours.

**581 Management of Production.** Analysis of the production function from a managerial point of view. Conceptual foundations, analysis of major problems and decision processes. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Topics such as the following will be offered:

- (a) Managerial Planning and Control
- (b) Business and Society
- (c) The Management Audit
- (d) Research and Development Management
- (e) International Management
- (f) History of Management Thought
- (g) Hospital Administration
- (h) Comparative Administration
- (i) Business Simulation

**691 Doctoral Core Seminar in Management.** Credit, 3 hours.

**791 Doctoral Seminar in Management.** Credit, 3 hours.

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## Marketing

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### Professors:

GWINNER (BA 397B), DOWNING, HARRIS, SCHMIDT, ZACHER

### Associate Professors:

BESSOM, CAMPBELL, GROSSMAN

### Assistant Professors:

GOURLEY, HENSEL, SCHLACTER

### ADVERTISING

**AD 301 Advertising Principles.** Advertising as a communications tool in marketing and business management. Consideration of creative methods, survey of media, measurements of effectiveness, and coordination with other

aspects of the sales and promotional program. Prerequisite: MK 300 or MC 110. Credit, 3 hours.

**311 Advertising Campaigns I.** Planning and preparation of advertising for broadcast and printed media. Creative strategy and its interpretation in copy and graphics. The communication process and its application to advertising messages. Prerequisite: AD 301. Two hours lecture, 2 hours laboratory. Credit, 3 hours.

**312 Advertising Campaigns II.** Continuation of AD 311. Advertising production for broadcast and printed media. Development and execution of the complete advertising campaign. Prerequisite: AD 311. Two hours lecture, 2 hours laboratory. Credit, 3 hours.

**371 Advertising Media.** Characteristics and use of broadcast and printed media in the advertising program. Relationship of media to markets. Audience measurement and analysis; media scheduling; space and time buying. Prerequisite: AD 301. Credit, 3 hours.

**453 Advertising Campaign Problems.** Problems in the planning and preparation of advertising for various media. Includes layout, copy and the complete production process. Prerequisite: AD 311. Two hours lecture, 2 hours laboratory. Credit, 3 hours.

**461 Advertising Management.** Administration of the complete advertising program. Advertising in the marketing mix, budgeting, media strategy, measurement of advertising effectiveness and coordination of advertising with other promotional activities. Use of the advertising agency. Prerequisites: AD 301; MK 300; and AD 371 or MK 451. Credit, 3 hours. See related courses: MC 110 Mass Communications; MC 401 Public Relations Techniques.

### MARKETING

**MK 300 Principles of Marketing.** Role of marketing in the society and economy. The business firm as a marketing system. Management of the firm's marketing effort,

including competitive strategy. Prerequisite: EC 202 or approval of instructor. Credit, 3 hours.

**302 Marketing Environments.** The firm's external environments, forces of change within them, and their influence on the firm's strategies and actions. The social, economic, technological, political, legal and competitive environments of the firm. Prerequisite: MK 300. Credit, 3 hours.

**304 Buyer Behavior.** An integration of behavioral concepts in the analysis of buyer behavior and in marketing strategy formulation. Prerequisite: MK 300. Credit, 3 hours.

**310 Principles of Selling.** Basic principles underlying the sales process and their practical application to sales situations. Economic, sociological and psychological relationships in the market place, applied to sales of industrial and consumer goods and intangibles. Credit, 3 hours.

**321 Principles of Retailing.** Role of retailing in marketing. Location, buying, promotion, organization, personnel and control in a retail enterprise. Prerequisite: MK 300. Credit, 3 hours.

**335 International Marketing.** The United States' position in world trade. Marketing strategy formulation by individual firms to serve foreign markets and to adapt to variations in factors affecting foreign marketing efforts. Prerequisite: MK 300. Credit, 3 hours.

**401 Public Relations in Business.** Role of public relations in business, government and social institutions, emphasizing policy formulation. Credit, 3 hours.

**411 Sales Management.** Application of management concepts to the administration of the sales operation. Prerequisite: MK 300. Credit, 3 hours.

**412 Marketing Communications.** The communication process as it relates to the promotional activities of the firm from a behavioral point of view. Prerequisite: MK 302. Credit, 3 hours.

**424 Retailing Management.** Problems of retailing management including functions within various institutions and retailing of commodities. Prerequisite: MK 321. Credit, 3 hours.

**434 Industrial Marketing.** Strategies for marketing products and services to industrial, commercial and government markets. Changing industry and market structures. Prerequisite: MK 300. Credit, 3 hours.

**444 Marketing Channels.** Distribution channels used by firms engaged in marketing and manufacturing. Strategies for marketing-channels management. Relationships among marketing intermediaries. Prerequisite: MK 300. Credit, 3 hours.

**451 Marketing Intelligence.** Integrated treatment of the traditional and decision-theory approaches to marketing research and analysis of environmental factors affecting marketing decisions in the firm. Prerequisite: QS 221 or approval of instructor. Credit, 3 hours.

**460 Marketing Decision-Making.** Decision-making by the marketing executive. Integration of all elements of the marketing program. Prerequisite: MK 302. Credit, 3 hours.

**501 Marketing Management.** Analysis of marketing problems from the management point of view. Credit, 3 hours.

**502 Public Relations Policies.** Case analysis of problems encountered in maintenance of favorable relationships between business organizations and the public. Development of sound public relations policies. Prerequisite: MK 401, or approval of instructor. Credit, 3 hours.

**520 Marketing and the Behavioral Sciences.** Concepts and theories from the behavioral sciences as they relate to marketing strategy formulation. Credit, 3 hours.

**522 Marketing Information.** Marketing research, marketing information systems and modern quantitative techniques in marketing

decision-making. Prerequisite: MK 501. Credit, 3 hours.

**563 Marketing Planning and Programming.** Current trends and developments in selected consumer and industrial markets. Development of competitive marketing strategy responses to changes in these markets. Individual research and case analysis. Prerequisite: MK 501. Credit, 3 hours.

**591 Seminar.** Credit, 3 hours. Topics such as the following will be offered:

- (a) Product Strategy
- (b) Price Strategy
- (c) Channel Strategy
- (d) Promotion Strategy
- (e) History of Marketing Thought
- (f) Marketing in a Changing Environment
- (g) International Marketing

**691 Doctoral Core Seminar in Marketing.** Credit, 3 hours.

**791 Doctoral Seminar in Marketing.** Credit, 3 hours.

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## Quantitative Systems

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**Professors:**

KAZMIER (BA 297B), McCREADY

**Associate Professors:**

HUSTON, PHILIPPAKIS

**Assistant Professors:**

ECK, HERSHAUER, ST. LOUIS

**Instructor:**

BAXTER

**QS 161 Quantitative Analysis and Statistics I.** Application of mathematical concepts and methods in business. Quantitative techniques in financial analysis. Introduction to mathematical models and the use of the computer in business. Prerequisite: MA 141 or equivalent. Credit, 3 hours.

**221 Quantitative Analysis and Statistics II.** Methods of statistical description. Application of probability theory and statistical inference in business. Prerequisite: QS 161 or concurrent registration. Credit, 3 hours.

**302 Electronic Data Processing.** Introduction to systems concepts and theory, systems analysis and design. Fundamentals of data processing equipment including both punched card equipment and electronic computers. Computer programming in FORTRAN or other suitable language. Credit, 3 hours.

**322 Managerial Statistics.** Applications of probability and statistical inference to business decisions. Decision theory and Bayesian inference. Prerequisite: QS 221. Credit, 3 hours.

**391 Operations Research.** Application of quantitative techniques in business organizations, such as the simplex method of linear programming, inventory models, games and strategies, and simulation. Prerequisite: QS 221. Credit, 3 hours.

**402 Programming Systems.** Concept underlying the design and operation of computer software. Elements of machine language programming. Higher-level languages, including COBOL and simulation languages. Time-sharing systems. Prerequisite: QS 302. Credit, 3 hours.

**407 Systems Analysis.** Sources, cost and value of information. Analysis and design of computer-based information systems. Analysis of information requirements, processing methods and control of operations. Prerequisite: QS 302. Credit, 3 hours.

**422 Advanced Business and Economic Statistics.** Application of multivariate analysis, including regression and correlation techniques, to business and economic problems. Time series analysis. Prerequisite: QS 322 or graduate standing. Credit, 3 hours.

**501 Fundamentals of Quantitative Analysis.** Basic mathematical concepts and methods underlying quantitative analysis. Emphasis on

interpretation and application rather than theorems and mathematical proofs. Model building, set theory, functional relationships, matrix algebra, differentiation and integration. Credit, 3 hours.

**502 Computer Information Systems.** Electronic data processing systems for administrative applications. Computer hardware, software, and FORTRAN and COBOL programming languages. Credit, 3 hours.

**510 Systems Models and Simulation.** Design of computer-based decision systems. Simulation as a research and decision-making tool. Prerequisite: QS 221 and FORTRAN programming. Credit, 3 hours.

**522 Statistical Decision-Making.** Role of sampling and statistical control procedures in managerial decision-making under conditions of risk and uncertainty. Fundamental probability distributions and their use in classical and Bayesian inference. Credit, 3 hours.

**523 Quantitative Models in Decision-Making.** Application of basic mathematical concepts to quantitative models, such as linear programming, stochastic processes, simulation and game theory. Credit, 3 hours.

**525 Advanced Statistical Methods.** Multivariate analysis, including multiple regression and correlation. Curvilinear regression analysis of business and economic data. Analysis of variance and experimental design. Prerequisite: QS 522. Credit, 3 hours.

**QS 791 Doctoral Seminar in Quantitative Systems.** Credit, 3 hours.

# College of Education

DELBERT D. WEBER, ED.D.

*Dean*

## Purpose

The central purpose of the College of Education is to provide initial preparation and continuing education to teachers and other professional personnel engaged in the educational programs of schools, colleges and other public and private agencies. This is accomplished primarily through direct relationships between the teaching faculty and their students.

Other purposes corollary to this are:

1. To contribute to the body of professional knowledge in the field of education through research, the development of educational theory, and innovation and experimentation in educational method and organization.
2. To offer leadership beyond the campus through the dissemination of information and ideas and through cooperative involvement with other agencies engaged in education.
3. To provide services to other agencies engaged in education in such manner as to promote improved educational practice throughout a widening sphere of influence.

## Organization

The courses of instruction offered by the College of Education are organized into departments so that a well-related sequence is established for important areas of concentration or specialization. These subject fields allow better organization in selecting courses which meet requirements for the various teacher education curriculums. A wide array of specialization possibilities thus exists.

For administrative purposes, these subject

fields are organized into the following departments: Elementary Education, Secondary Education, Educational Administration and Supervision, Educational Foundations, Counselor Education, Educational Psychology, Special Education, and Educational Technology and Library Science. The subject fields which are offered follow:

- Adult Education
- Audiovisual Education
- Counselor Education
- Educational Administration and Supervision
- Educational Foundations
- Educational Psychology
- Educational Technology
- Elementary Education
- Higher Education
- Indian Education
- Instructional Materials
- Library Science
- Reading Education
- Safety Education
- Secondary Education
- Social and Philosophical Foundations
- Special Education

There are several bureaus, centers or special laboratories which directly assist in the work of the College of Education. These include the University Testing Service, Bureau of Educational Research and Services, I. D. Payne Laboratory, Indian Education Center, Reading Clinic, Counselor Training Laboratory, Center for Higher Education and others throughout the University. All of these facilities serve as laboratories for educational training.

## Degrees

### **Bachelor of Arts in Education Degree.**

Several undergraduate programs are available leading to the degree Bachelor of Arts in Education and requiring a minimum of 126 semester hours of credit. Each of these programs is designed to prepare the student for work in some particular educational area.

### **Master of Arts in Education Degree.**

A graduate program consisting of a minimum of 30 semester hours of properly arranged work leads to the degree of Master of Arts in Education. For specific reference to this program, see Graduate College section in this catalog.

**Master of Counseling Degree.** A first level professional degree, Master of Counseling, is awarded upon the satisfactory completion of a two-year (60 semester hours) program of approved graduate studies. This program provides for a core of required professional studies supported by required and elective subjects in related disciplines, and for professional specialization options in one of four occupational settings — elementary school counseling, secondary school counseling, college counseling and student personnel work or employment and adult counseling. Satisfactory completion of the program leads to professional counselor certification in Arizona and other states, and to further advanced professional preparation at the doctoral level.

**Education Specialist Degree.** The degree Education Specialist is awarded for satisfac-

tory completion of the Specialist Program of graduate studies. For specific reference to this degree, see Graduate College section in this catalog.

**Doctor of Education Degree.** The degree Doctor of Education is awarded for satisfactory completion of the Doctoral Program of graduate studies. For specific reference to this degree, see Graduate College section in this catalog.

**Doctor of Philosophy Degree.** The degree Doctor of Philosophy is awarded for satisfactory completion of this Doctoral Program of graduate studies. For specific reference to this degree, see Graduate College section in this catalog.

## Certification

**Arizona Certification.** The College of Education at Arizona State University is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary teachers and school service personnel.

Students who successfully complete the teacher education curricula planned by the College of Education are recommended to the Director of Certification, Arizona State Department of Education for the appropriate Arizona certificate and are eligible for certification in all states participating in the NCATE reciprocity practice.

For further information concerning certification, students should contact the office of the Coordinator of Student Advisement in the College of Education.

## Admission to Undergraduate Programs

Undergraduate students at Arizona State University may apply for admission to the College of Education during the second semester of their sophomore year. Students transferring from outside institutions need not make separate application for admission to the College of Education inasmuch as they will be routinely admitted at the time of admission to the University, provided they otherwise meet admission criteria.

To enroll in Elementary Education, Secondary Education or other undergraduate programs leading to the Bachelor of Arts in Education degree, the student must have reached junior status (defined here as a minimum of 56 semester hours) or be currently enrolled in sufficient work to obtain junior status. In addition, he must have earned a cumulative grade point average of at least 2.25. In addition, applicants may be requested to take selected physical and psychological examinations, and/or meet other criteria for admission. During his first two years of college study and preceding his admission, he should have completed those course requirements which have been established as prerequisites for entrance to the College of Education.

During the freshman and sophomore years, the student planning admission to the College of Education at the end of his second year will register as follows:

1. If interested in *teaching in the secondary school*, he will enroll in the appropriate college for his first two years and will list his proposed teaching field as his major followed in parentheses by the term "Pre-Secondary." Examples are shown below to indicate specifically how this will be accomplished.

<i>College</i>	<i>Teaching Field</i>	<i>Major first two years</i>
Liberal Arts	English	English (Pre-Secondary)
Fine Arts	Instrumental Music	Instrumental Music (Pre-Secondary)
Business Administration	Business	Business (Pre-Secondary)
Engineering	Industrial Arts	Industrial Arts (Pre-Secondary)

The major teaching fields available are shown under Secondary Curriculum section of this catalog. (See page 144.)

The College in which the student is enrolled will assign an advisor from the appropriate major department in cooperation with the College of Education.

2. If interested in *teaching in the elementary school*, he will register in the College of Liberal Arts but will list his major as "Pre-Elementary Education." Such students will be assigned an advisor from the College of Education as soon as this major is listed even though they will not be admitted to the College of Education until they have completed the first two years of study.

3. If interested in *teaching in the area of special education*, he will register in the College of Liberal Arts but will list his major as "Pre-Special Education." Such students will be assigned an advisor from the College of Education's Department of Special Education, even though they will not be admitted to the College until they have completed the first two years of study.

**Retention Policy.** The Retention Policy of the College of Education has inherent in it the following purposes:

1. To select those students for admission to a teacher education curriculum who are

capable of pursuing and completing the curriculum.

2. To assist students in identifying their strengths and weaknesses so that they may realize their greatest potential in education.

3. To improve the quality of the teachers prepared at this institution.

4. To attract able students to the profession and more specifically to the various curricula of the College of Education.

5. To provide a framework for follow-up research on the education of teachers.

**General Studies.** A total of 36 semester hours of general studies (general education) must be completed before the student is eligible for graduation in any of the undergraduate curricula offered by the College of Education. It is anticipated that heavy emphasis will be placed on these requirements during the first two years of study before formal admission to the College of Education. The following minimum requirements exclusive of education courses indicate the general nature of the distribution which must be met as the student completes this basic requirement:

1. At least two courses for a minimum of 8 semester hours credit in the Humanities and Fine Arts (exclusive of freshman English);

2. At least two courses for a minimum of 8 semester hours credit in the Social and Behavioral Sciences;

3. At least two courses for a minimum of 8 semester hours credit in Sciences and Mathematics.

The student should consult with his advisor for specific recommendations of requirements within the area of general studies in order to build an acceptable pattern of courses and to be qualified for admission to and graduation from the College of Education.

**GRADUATION REQUIREMENTS.** To be eligible for the Bachelor of Arts in Education the student must fulfill the following requirements:

a. Complete an approved teacher education curriculum as outlined in this catalog;

b. Complete at least 126 semester hours of study with a cumulative grade point index of 2.00 or better;

(1) For all courses taken while a student at the university;

(2) For all courses included in his major teaching field;

(3) For all professional education courses;

c. File a written application for graduation acceptable to the College of Education Standards Committee;

d. Be recommended for graduation by the faculty of the College of Education.

### Student Teaching

Undergraduate students in the Elementary

Education Curriculum must be approved for Student Teaching by their advisors, the chairman of the Department of Elementary Education, and the Standards Committee of the College of Education. Undergraduates in the Secondary Education Curriculum must be approved by their advisors, the chairman of the Department of Secondary Education, the Standards Committee and the Coordinator of Student Teaching in the department fielding the major in which they will be assigned for student teaching. Undergraduate students in the Special Education Curriculum must be approved by their advisors, the chairman of the Department of Special Education and the Standards Committee of the College of Education. Graduate students must be approved by the same agencies as undergraduates. Students must be admitted to the College of Education's approved teacher education program and have completed the appropriate prerequisites to be eligible for admission to student teaching.

**Application.** Students who apply for student teaching **MUST HAVE COMPLETED AT LEAST 12 SEMESTER HOURS OF COURSES AT ARIZONA STATE UNIVERSITY** prior to the date on which they begin their student teaching assignment. Students must also have completed the proper course prerequisites to be admitted to student teaching.

Application for student teaching must be made with the Director of Professional Field Experiences between the dates of March 15 and July 1 for an assignment during the fall semester, between the dates of September 25 and November 1 for an assignment during the spring semester, and between the dates of December 15 and April 15 for an assignment during the summer session.

Only secondary school student teaching is offered in the summer sessions. Applications

for summer session student teaching will be accepted only from those students who will have completed all other requirements for degrees and certificates except the student teaching requirement. A limited number of student teaching assignments will be made on a first-come, first-served basis. The opportunities for student teaching experiences in the summer are extremely limited, and no student should definitely plan to meet this requirement during the summer.

Students who apply for student teaching after the deadlines named above may not be assigned to student teaching until the next following spring or fall semester.

**Requirements.** Students admitted to student teaching must have a cumulative grade point index of 2.25 or better. In addition, a 2.00 grade point index is required in (1) the major teaching field and (2) for all courses included in the professional education sequence before a student is admitted to student teaching.

Students in the Elementary Education Curriculum, whose programs permit, devote their full time to student teaching all day in the cooperating schools. Others teach in the cooperating schools for one-half day for one semester. In either case, student teaching occurs during the first or second semester of the senior year for elementary education students.

Students who are preparing for secondary certification teach for one-half school day for one semester during the first or second semester of their senior year. A few students devote full time to student teaching all day when their programs permit.

Students who are preparing for Special Education certification will divide their student teaching between regular classroom and Special Education classroom experiences.

The student's course load is limited to 16 semester hours during the semester in which he is teaching. Student teachers are not permitted to take part in activities that interfere with their student teaching conferences, seminars or other activities related to teaching in the cooperating school.

Student teachers are required to adhere to the rules, regulations and philosophy of the school in which they are accepted to conduct their student teaching.

**Training Schools Available.** Excellent schools and school systems cooperate with the College of Education in the training of student teachers. Each of the schools presents its own particular type of organization and problems so that the student may receive training in any type of work desired from the kindergarten through the high school. Each student teacher is under direct guidance of a supervising teacher, a college supervisor and the Director of Field Experiences.

**Student Teaching Waiver.** Students who have been employed as regularly state-certified teachers in accredited private, public, parochial, or Indian schools may apply to the Director of Professional Field Experiences, College of Education, for waiver of the student teaching requirement. Substitute teaching experience is not acceptable as a replacement for student teaching. Waiver of student teaching in the required grade level is granted by the Director of Professional Field Experiences. Waiver of this requirement in no way changes the total number of semester hours required for graduation or for establishing residence.

Regular teaching experience in the required grade level of two years' duration within the past five years will be considered sufficient to waive the total student teaching requirement.

Regular teaching experience in the required grade level of one year's duration within the past five years will be considered sufficient to waive one-half the student teaching requirement.

Regular teaching experience in the required grade level prior to the past five years will be evaluated at one-half the rate established above for waiver of the student teaching requirement.

The required grade level is described as follows: elementary level includes kindergarten through eighth grade; secondary level includes grades seven through twelve.

Former superintendent(s) or principal(s) must write the Director of Professional Field Experiences certifying the student's employment, date of employment, grades and/or subjects taught, and his success as a teacher. This letter is evaluated in terms of the above information.

Students who have met the full student teaching requirement of another American Association of Colleges for Teacher Education member institution, which is also accredited by the National Council for Accreditation of Teacher Education, may petition through the College of Education Standards Committee to have their student teaching experience requirement interpreted as fully met.

**Honors Program.** An Honors Program is available within the College of Education for the exceptional student. It is administered by the Standards Committee which serves as an Honors Council. A more detailed description of this program will be found in the Honors Program section of this catalog, page 29.

**Pass-Fail Courses.** Students in the College of Education may participate in the Pass-Fail

program of the College of Liberal Arts described on page 52. However, no course taken for Pass-Fail may be counted toward the student's major or minor teaching field requirements or other required academic specialization.

### Bachelor of Arts in Education

**Elementary Education Curriculum.** The Elementary Education Curriculum offers professional education courses designed to prepare students to teach all levels of the elementary school. Students may also develop special competency in such areas as early childhood education, art, music, social studies, mathematics, language arts, library science, physical education, science and foreign language by using elective hours to take additional course work prescribed by their advisors.

This curriculum leads to the degree of Bachelor of Arts in Education and to certification for teaching in the kindergarten and grades one through eight.

To enroll in Elementary Education, the student *must have reached junior year status (defined here as a minimum of 56 hours)* and must have a cumulative grade point average of at least 2.25.

**MAJOR.** The major in this field is elementary education.

**ACADEMIC SPECIALIZATION.** All elementary education majors must complete a program of academic specialization consisting of 33 semester hours. *A minimum of 18 semester hours of this program must be in a single subject field, approved by the advisor.* The remaining 15 hours may be taken under one of the following four options:

1. Fifteen additional hours in the same subject field.
2. Fifteen hours in a second subject field.
3. Fifteen hours of interdisciplinary study.
4. Fifteen hours of specialization in a field such as library science, special education, reading or educational technology.

Appropriate courses may be used to satisfy general education requirements as well as the requirements for academic specialization. However, such courses must be approved by the student's advisor.

**GENERAL PATTERN.** A program of 126 approved semester hours is required. This is divided as follows:

	Semester Hours
General Studies .....	36
For specific courses, see General Studies listings on pages 28-29.	
Freshman English* .....	6
Elementary Professional Education ...	36
Academic Specialization .....	33
Electives .....	15-18

\*Except students completing EN 104, who need only 3 semester hours.

Advisors in this curriculum have check sheets with recommended and required courses for each year of work. These check sheets contain appropriate patterns of course work for the age level of pupils with whom the students as teachers will want to work. The check sheets also contain recommendations for electives. It is necessary for students to consult advisors in this curriculum in order to insure the best possible program of training. This is particularly important inasmuch as the advisor must sign the check-out sheet for graduation which indicates that an approved program of course work has been developed.

**Secondary Curriculum.** This curriculum prepares students for teaching in the secondary school. Majors and minors are completed in the teaching fields desired. The curriculum has considerable flexibility for those who wish to pursue specialized work in addition to the regular expectations for teaching. This curriculum leads to the degree of Bachelor of Arts in Education and to the certification for teaching in the secondary school (grades seven through twelve).

**SUGGESTED PATTERN.** A program of 126 approved semester hours is required. This is divided as follows:

	<i>Semester Hours</i>
General Studies* .....	36
For details, see pages 28-29.	
Freshman English .....	3-6
Major Teaching Field (Required) ...	36-42
Minor Teaching Field (optional) ....	24
Professional Education .....	25
United States and Arizona Constitution*	3

\*United States and Arizona Constitution is a state teacher certification requirement and may be included in the general studies field of Behavioral and Social Sciences.

Advisors in this curriculum have check sheets with recommended courses for each year of work. The check sheets include recommendations for electives. Students should consult advisors in this curriculum in order to insure the best possible program. This is necessary for the following reasons: (1) An advisor approves a program of studies prior to registration of each semester. (2) An advisor signs the graduation check-out sheet for the student. (3) Check sheets are revised each year on the basis of refinements which are incorporated into the program. (4) Check sheets offer excellent opportunity for the student to keep a record of his progress throughout the curriculum.

**TEACHING FIELDS.** Students in the secondary curriculum are required to complete a program of preparation in a major teaching field. This program consists of 36 to 42 semester hours of course work determined by the academic department. In the fields of music, art, physical education and industrial education, which require special certification, the program may consist of more than 42 semester hours. A minimum of 18 semester hours of work in the major teaching field should be at the upper division level. Appropriate courses may be used to satisfy general studies requirements as well as the requirements of a major teaching field. However, such courses must be specified as required for the major teaching field or approved by the advisor as satisfying major teaching field requirements. In certain related areas it is possible to become prepared to teach in two fields through completion of a 60 semester hour program. Information about the specific options available may be obtained at the Office of Advisement of the College of Education or the college offering the program.

Opportunity is also available for students to complete a program of preparation in a minor teaching field consisting of 24 semester hours of course work determined by the academic department.

In many instances employment opportunities require teaching in more than one field. It is strongly recommended that students add to their professional versatility by either completing a program in a minor teaching field or a program in Elementary Education leading to dual certification at both the elementary and secondary school levels. Students should at least make a substantial beginning toward preparation in a second teaching field. The North Central Association requires that a teacher have preparation con-

sisting of not less than 24 semester hours of credit in a specific field in order to teach in that field in an accredited secondary school. Considerable attention should be given to the selection of teaching combinations. Information regarding this may be obtained from the student's advisor.

#### MAJOR TEACHING FIELDS AVAILABLE.

Art  
 Biological Sciences  
 Business, Office  
 and Distributive Education  
 Chemistry  
 Chinese  
 Choral Music  
 Dance  
 Economics  
 Engineering Sciences  
 English  
 French  
 General Science  
 Geography  
 Geology  
 German  
 Health Education  
 History  
 Home Economics  
 Industrial Education  
 Instrumental Music  
 Journalism  
 Mathematics  
 Physical Education  
 Physics  
 Political Science  
 Russian

Spanish  
Speech Communication  
Theatre

MINOR TEACHING FIELDS AVAILABLE. In addition to minors in the above fields, the following minors are available:

Anthropology  
Drafting  
Driver Training and Safety Education  
Electronics  
Elementary Education  
Graphic Arts  
Humanities  
Latin  
Library Science  
Metals  
Photography  
Physical Science  
Portuguese  
Psychology  
Reading  
Sociology  
Special Education  
Transportation and Power  
Woods

Other minors can be developed with the approval of the chairman of the department or the major advisor under which the minor is developed or the Dean of the College of Education.

PROFESSIONAL EDUCATION PATTERNS AVAILABLE.

A. Regular Pattern:

*Professional Education.* In addition to the courses listed under other requirements, all

students registered under this pattern of the secondary curriculum are required to take 25 semester hours of work in Education. The following must be included: SE 310, (EF 111 may be substituted for SE 310), EP 310, Education Elective, SE 311, 411, Methods of Teaching in the Major Teaching Field, and SE 433.

B. On-site Secondary Teacher Education Pattern:

An on-site design stressing participation in secondary schools is being tested and is available for a limited number of students. Those interested in this pattern should obtain materials and information from the Secondary Education Department.

*Professional Education.* In addition to the courses listed under other requirements, all students registered under this pattern of the secondary curriculum are required to take 25 semester hours of work in Education. The following must be included: SE 410, 433, 498 and Methods of Teaching in the Major Teaching Field.

It should be emphasized that this pattern requires courses during specific semesters of the junior and senior years and that some of them must be taken concurrently.

**Library Science.** Students who desire to prepare for librarianship may choose a minor field in library science. The undergraduate program of professional education for librarians should also include a systematic survey of the various fields of knowledge, concentration in one or more subject fields taught in Arizona schools, background courses of special value in library science, study of professional principles and methods common to all libraries.

Students who have completed a minor field in library science at the undergraduate level

may select library science as a field of specialization at the graduate level.

Seniors having a library science minor in the elementary education program may divide their nine hours of student teaching into a combination of five hours of credit at a grade level and four hours of credit in the school library. Those graduate students who hold a teaching certificate, and who complete a library science minor for the state library stamp, may elect to enroll independently in LS 483 Library Practice.

MINOR FIELDS IN LIBRARY SCIENCE. The minor in library science consists of 24 semester hours as prescribed by the department. These courses vary in terms of the needs and interests of the student.

## Special Programs

**Special Programs of Teacher Preparation.** Several fields of specialization are available on the undergraduate level in connection with any of the undergraduate curriculums. These are available as a sequence of courses to be taken in addition to the regular requirements of the undergraduate curriculum.

**Teaching Indian Children.** Students pursuing the elementary program may, in the junior year, with the approval of the advisor, elect to take a special sequence preparatory to the teaching of Indian children. This is appropriate for those who will have only a few Indian children in a classroom, or for those who will have a classroom composed only of Indian children. These students shall be required to complete satisfactorily the basic elementary program.

Students pursuing a major teaching field in secondary education may also take this special training for teaching Indian children.

Such students shall be required to complete satisfactorily the basic secondary major.

	<i>Semester Hours</i>
IE 422 Methods of Teaching Indian Children .....	3
IE 424 Curriculum and Practices of Indian Education .....	3
IE 490 Problems of Teachers of Indian Children .....	3
EE 478 Directed Teaching in the Elementary School .....	5
or	
SE 433 Directed Teaching in the Secondary School ....(3)	(3)
AN 221 Indians of the Southwest .....	3
AN 421 The American Indian .....	3
	18 or 20

**Teaching Spanish in the Elementary School.** Students pursuing the elementary program may, with the approval of the advisor, elect to take a special sequence preparatory to the teaching of Spanish in the elementary school. These students shall be required to complete satisfactorily the basic four-year elementary program.

	<i>Semester Hours</i>
SP 201, 202 Intermediate Spanish .....	8
SP 311, 312 Spanish Conversation .....	6
SP 313, 314 Spanish Composition .....	6
SP 417 Spanish Phonetics .....	3
	23

SP 485, 486 Spanish for Elementary Teachers is designed for teachers interested in introducing the teaching of Spanish in the elementary grades. It emphasizes the fundamentals of Spanish, integrating the techniques of teaching at the elementary level. Other suggested courses are SP 321,

322 Spanish Literature, SP 472 Spanish-American Civilization, FL 480 Methods of Teaching Foreign Languages, and FL 421 Directed Reading for Majors.

### Other Special Programs

Students pursuing the elementary program may, with the approval of the advisor, elect to take a special sequence preparatory to specialization in a special field in the elementary school. Fields include Art, Physical Education, Home Economics, Music, Industrial Education, Conservation Education, Safety Education and others. These students shall be required to complete satisfactorily the basic elementary program.

**Five-Year Program to Prepare Teachers of Mentally Retarded Children.** Students who elect to do so may pursue a five-year specialized program which prepares teachers of mentally retarded children. This program contains much of the undergraduate program for elementary school teachers with a fifth year of graduate level specialization for working with mentally retarded children. The total program can be completed within four calendar years, including three summers. The completed program results in the student receiving a bachelor's and a master's degree, and Certification in Mental Retardation and in Elementary Education.

**SUGGESTED PATTERN.** A program of 156 approved semester hours is required. This is divided as follows:

	<i>Semester Hours</i>
General Studies .....	36
For specific courses, see General Studies listed on pages 28-29.	
Freshman English .....	6
(Partial exemption possible)	

Elementary Professional Education .....	36
Special Education .....	36
Academic Specialization .....	18
Other Required Courses .....	6
Electives .....	18

Advisors in this curriculum have check sheets with recommended and required courses for each year of work. The check sheets also contain recommendations for electives. It is necessary for students to consult advisors in this curriculum in order to insure the best possible program of training. This is particularly important inasmuch as the advisor must sign the check-out sheet for graduation which indicates that an approved program of course work has been developed.

**Recommended Minor or Specialization in Special Education.** Majors in Elementary and Secondary Education, in consultation with their advisors, may select the following minor or specialization in Special Education. This minor or specialization does not meet Arizona certification requirements for teaching in Special Education, and does not include a Student Teaching requirement.

*Required:* SP 311 Orientation to Education of Exceptional Children.

*Additional semester hours selected from the following:* SP 312 Mental Retardation; SP 320 Participation with Mentally Retarded Children; SP 321 Methods of Teaching the Mentally Retarded; SP 436 The Emotionally Disturbed Child; SP 446 The Disadvantaged Child; SP 447 Methods of Teaching the Disadvantaged; SP 448 The Mexican American Child; SP 461 Characteristics and Diagnosis of Learning Disabilities; SP 462 Methods of Remediating Learning Disabilities; SP 474 Educational Evaluation of the Handicapped.

**The Center for the Study of Higher Education.** The Center has as its purpose the coordination of present and potential institutional resources to provide for three general services to higher education: graduate instruction, research and development and field service.

Instructional programs are available at the graduate level to prepare administrative officers for universities, colleges and junior colleges. The only graduate degree offered presently is the Ph.D. with specialization in Higher Education – Administration.

Inquiries should be addressed to the Director, Center for the Study of Higher Education, College of Education, Arizona State University.

### Departmental Major Teaching Field Requirements

**Bachelor of Arts in Education Degree Curriculum.** Major teaching fields required under the secondary curriculum offered by the College of Education, leading to the degree of Bachelor of Arts in Education, are offered in the departments of the College of Liberal Arts, the College of Business Administration, the College of Engineering Sciences and the College of Fine Arts. Consult the appropriate departments for statements of these requirements.

**Departmental Graduate Programs.** The departments of the College of Education offer programs leading to the degrees of Master of Arts in Education, Master of Counseling, Education Specialist, Doctor of Education and Doctor of Philosophy.

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## Elementary Education

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### Professors:

STROM (ED B-225), BOYD, DOYLE, JONES, LEWIS, MALONE, MANNING, O'BEIRNE, PODLICH, STOUT, VEATCH

### Associate Professors:

BELL, BYERS, OLMSTED, RAY, SILVAROLI

### Assistant Professors:

BITTER, CHRISTINE, CROUCH, DUDEK, KNAUPP, LEE, MERTENS, O'BRIEN, SCHALL, STALEY, STEERE, TALBERT

### Lecturer:

VERNER

### ELEMENTARY EDUCATION

**EE 310 Creative Activities for the Young Child.** Concepts of creativity in current research. Approaches to creative teaching and learning through motivation, environmental changes and experimentation. Credit, 3 hours.

**311 Social Studies in Early Childhood Education.** Development of democratic living in all areas of the curriculum. Considers objectives, unit planning, problem solving, selection of content, scope and sequence, construction of instructional material and resources. Provides for experiences with children. Credit, 3 hours.

**312 Nursery-Kindergarten Education.** Considers all aspects of curriculum. Philosophy, principles, practices, problems and evaluation in the integrated experience program. Credit, 3 hours.

**313 Child Development.** Major principles underlying the total development of the child during the pre-school and elementary school years with observations in school settings. Enhancement and understanding of the child in the physical, intellectual, social and emotional areas of development. Credit, 3 hours.

**314 The Teaching of Reading.** Reading for the classroom teacher, involving the application of expanding resources in the solving of reading problems. Designed primarily for classroom teachers in terms of reading techniques, procedures and organizational plans. Prerequisite: Admission to the elementary teacher education curriculum. Credit, 3 hours.

**322 Communication Arts in Early Childhood Education.** Factors affecting language development. Setting conditions for learning in listening, speaking, reading and writing. Proficiency in handwriting and spelling required. Laboratory experiences are included as part of the course content. Credit, 3 hours.

**333 Communication Arts in the Elementary School.** Factors affecting language growth. Setting conditions for learning to teach listening, speaking and writing skills. Emphasis on middle and upper grades. Proficiency in handwriting and spelling required. Laboratory experiences are included as part of the course content. Credit, 3 hours.

**344 Elementary Curriculum.** Program of the emerging elementary school. Principles, practices and problems. Interrelationships and synthesis. Credit, 3 hours.

**355 Social Studies in the Elementary School.** The core function of social studies, scope and sequence, unit organization, methods of instruction, materials and resources for learning. Credit, 3 hours.

**366 Observation and Participation.** Provides an opportunity for students to observe and work directly with elementary children in a classroom situation. Includes a critical evaluation of the student's experiences. Credit, 3 hours. Y grade only.

**380 The Teaching of Mathematics in the Elementary School.** A beginning course in the methods and materials used in teaching mathematics in the elementary school. Laboratory experiences with curriculum materials is included as part of the course content. Prerequisite: MA 180, its equivalent,

or successful completion of a mathematics proficiency examination. Credit, 3 hours.

**411 Early Childhood Education.** Practical consideration of basic principles, experiments, research studies, and recent trends as factors related to the education of children through seven years of age. Prerequisite: EE 312. Credit, 3 hours.

**451 Current Reading Practices.** Special consideration given to the implementation of selected factors for classroom practices. Credit, 3 hours.

**478 Student Teaching in the Elementary School.** The relationship of theory and methods of teaching, the practice of teaching; practice in guidance, measurement, extra-curricular activities and classroom management procedures. Prerequisite: Must have completed 21 semester hours of the core in the major field and be admitted to the elementary teacher education curriculum. Credit, 3-15 hours. Y grade only.

**511 Elementary Curriculum Development.** Approaches to curriculum change, analysis of typical curriculum problems, strategies and procedures in improving current programs. Prerequisite: EE 344 or equivalent. Credit, 3 hours.

**513 Child Development.** A continuation and more thorough analysis of the major principles, theories and research concerning the elementary school child and his development. An integrated approach to the study and facilitation of wholesome educational and psychological development. Credit, 3 hours.

**522 Developmental Social Experiences in Early Childhood Education.** Materials, techniques, esthetic expression, creative activities and values in the integrated curriculum. Prerequisite: EE 311 or equivalent. Credit, 3 hours.

**525 Communication Arts in Early Childhood Education.** Significant problems, trends of current programs and oral language development. Opportunity for self-directed study.

Prerequisite: EE 322 or equivalent. Credit, 3 hours.

**526 Communication Arts in the Elementary School.** Significant problems and trends of current programs. Emphasis on research contribution in oral language development. Opportunity for self-directed learning. Prerequisite: EE 333 or equivalent. Credit, 3 hours.

**527 Mathematics in Early Childhood Education.** Theory and practice in the use of manipulative materials for teaching mathematics to preschool and primary grade children. Prerequisite: EE 380 or equivalent. Credit, 3 hours.

**528 Social Studies in the Elementary School.** Significant problems and trends of current programs. Development of a balanced and articulated program of social studies. Prerequisite: EE 355 or equivalent. Credit, 3 hours.

**529 Science in the Elementary School.** Significant problems and trends of current programs. Development of a balanced and articulated science program. Prerequisite: PL 320 or equivalent. Credit, 3 hours.

**537 Mathematics in the Elementary School.** Contemporary mathematics programs used in elementary schools. Content, materials and approaches to instruction. Prerequisite: EE 380 or equivalent. Credit, 3 hours.

**544 Play Education.** Conflicting theories of play and the educational implications of each in a curriculum. A practical application in the lower levels of the elementary school. Credit, 3 hours.

**555 Modern Practices in Early Childhood Education.** Trends and practices, instructional and resource material, methods and techniques in early childhood education. Prerequisite: EE 312 or equivalent. Credit, 3 hours.

**711 History of Curriculum Development in the Elementary School.** Elementary school curriculum from colonial times to the present with concomitant attention to the philosoph-

ical assumptions and theories of learning which influenced the selection of content. Prerequisite: EE 511 or equivalent. Credit, 3 hours.

**722 Issues in Elementary Education.** Problems, trends, issues and research in elementary education, and their relationship in modern educational practices. Credit, 3 hours.

## READING EDUCATION

**RE 433 Reading: Elementary School.** A reading program for teachers-in-training, aimed at improving skills in word recognition (specifically phonics) and comprehension. Classroom practices in reading and testing are included. Credit, 3 hours.

**466 Reading: Upper Grades.** Acquaints the teacher-in-training with procedures and practices in reading which are related to various subject matter fields. Specific skill development and evaluation techniques for upper grades. Credit, 3 hours.

**467 Reading: Secondary School.** Designed for secondary teachers-in-training to enable them to serve the reading needs of junior and senior high school students. Wide-scope study of secondary reading, remedial and corrective programs, with emphasis on content area reading. Credit, 3 hours.

**481 Reading Clinic.** Teachers-in-training work directly with students who are disabled in reading. Techniques employed in treating disabilities. Prerequisite: EE 314, RE 433 or 466. Credit, 3 hours.

**505 Elementary Reading.** Phonics for classroom teachers, designed to improve reading programs for developmental and corrective readers. Teacher skills, evaluation and approaches used for teaching reading. Prerequisite: Teaching Certificate. Credit, 3 hours.

**507 Reading in the Junior-Senior High School.** Acquaints the classroom teacher, at these levels, with reading in content fields. Techniques involved in readability, vocabulary and

efficient reading. Prerequisite: Teaching Certificate. Credit, 3 hours.

**544 Special Reading Programs: Secondary.** Recommended procedures for working with corrective reading cases at the secondary school level. The role of the junior and senior high school special reading teacher. Prerequisite: RE 507 or approval of instructor. Credit, 3 hours.

**550 Directed Experiences in Reading.** Affords the opportunity to employ visual-auditory-kinesthetic treatment techniques acquired in previous reading courses. Teachers work directly with corrective reading problems. Prerequisite: RE 505 or 507. Credit, 3 hours.

**556 Diagnostic and Treatment Procedures in Reading.** Experience in administering and interpreting diagnostic tests in reading and related areas. Treatment of specific reading disabilities and preparation of materials are emphasized. Prerequisite: RE 505 or 507. Credit, 3 hours.

**557 Reading Clinic Experience.** The special reading teacher develops advanced clinical reading programs for disabled readers. Use of remedial materials and techniques. Prerequisite: RE 556. Credit, 3 hours.

**581 Individualizing Reading Instruction.** To acquaint experienced teachers with individualized reading programs. Lectures, visual aids and demonstrations should enable experienced teachers to conceptualize the rationale and practice related to these instructional programs. Prerequisite: RE 505, 507, or 556. Credit, 3 hours.

**Special Courses:** See pages 46-47.

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## Secondary Education

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**Professors:**

HAGGERSON (ED A-409), JAMES W. BELL,  
FRASIER, FULLERTON, GRIFFITH, JELINEK,  
McGRATH, PERRIL, RICE, ROVER

**Associate Professors:**

ARMSTRONG, JOHN E. BELL, CHASEY,  
COOK, EDWARDS, FETTERHOFF, KIESOW,  
SVOBODA

**Assistant Professors:**

COHEN, PARRISH, PIERCEY

### SECONDARY EDUCATION

**SE 310 The Secondary School.** Development of American secondary education. Controversial viewpoints regarding American secondary schools. Challenges confronting secondary school teachers. Observations and/or discussion sections may be required. Prerequisite: admission into secondary education curriculum. Credit, 3 hours.

**311 Principles and Curricula of Secondary Schools.** Principles, purposes, organization and curricula of secondary schools, emphasizing current curricula materials, trends and issues. Prerequisites: EP 310 or equivalent, SE 310, and admission to a secondary teacher education curriculum. Discussion sections may be required. Credit, 3 hours.

**410 Observation and Participation in the Secondary School.** Students observe and work directly with secondary school pupils in a classroom situation. Prerequisite: admission to secondary education curriculum. Seminar may be required. Credit, 1-7 hours.

**411 Teaching and Evaluating in Secondary Schools.** Methods, procedures, techniques and instruments of teaching and evaluating in secondary schools. Prerequisite: SE 310, EP 310 or equivalent, SE 311, and admission to a secondary teacher education curriculum.

Laboratory section may be required. Credit, 3-4 hours.

**433 Student Teaching in the Secondary School.** Relationship of theory and practice in methods of teaching, practice of teaching; practice in guidance, measurement, extra-curricular activities and classroom management procedures. Prerequisites: EP 310, SE 310, 311, 411, 480 (special methods) and admission to a secondary teacher education curriculum. Credit, 3-12 hours. Y grade only.

**444 The Junior High School.** Development, purposes, organization, curricula and students of the junior high school, with emphasis on curriculum. May be taken in lieu of SE 311 by those preparing for junior high teaching. Prerequisites: EP 310 or equivalent, SE 310. Credit, 3 hours.

**522 Secondary School Curriculum Development.** Social processes, issues, principles, patterns and procedures in curriculum development. Prerequisites: SE 433 or equivalent. Credit, 3 hours.

**533 Improving Instruction in Secondary Schools.** Tools of self-evaluation, analytical appraisal of procedures, methods, techniques and experimental approaches to teaching in secondary schools. Prerequisite: SE 433 or equivalent. Credit, 3 hours.

**555 Student Activities in the Secondary School.** Development, purposes, and principles of student activities as they are related to the educational program of the secondary school. Prerequisite: SE 433 or equivalent. Credit, 3 hours.

**566 Evaluating Secondary School Programs.** Development of evaluative criteria. Group and individual work in evaluation, using schools and classes of those enrolled as the source of problems for discussion and analysis. Prerequisite: SE 433 or equivalent. Credit, 3 hours.

**577 Recent Issues and Trends in Secondary Education.** Recent committee reports, problems facing American secondary schools, and

recent issues. Prerequisite: SE 433 or equivalent. Credit, 3 hours.

**588 Human Relations in the Secondary Schools.** Human relations problems in the school resulting from the interaction of teachers, pupils, administrators, laymen and nonprofessional staff. Prerequisite: SE 433. Credit, 3 hours.

**711 Secondary Curriculum Development.** Factors bearing on the development of a qualitative learning environment in the secondary school, the evaluation of research and the individual study of fundamental problems in secondary curriculum development. Prerequisites: SE 433, 522 or equivalent. Credit, 3-4 hours.

**722 Improvement of Instruction in the Secondary School.** Factors bearing on the improvement of instruction in the secondary school, the evaluation of research and the individual study of fundamental problems in the improvement of instruction in the secondary school. Prerequisites: SE 433, 533. Credit, 3-4 hours.

**Special Courses:** See pages 46-47.

### SAFETY EDUCATION

**ST 466 Safety Education.** Various phases of safety education: home, school and on-the-job. Emphasis on special interests of class members. Prerequisite: Admission to College of Education curriculum. Credit, 3 hours.

**477 Driver and Traffic Safety Education I.** Critical analysis of traffic accidents and attitude factors involved. Development of a broad background of automobile operation, traffic laws and high level driving skills. Prerequisites: valid operator's license and ST 466. Credit, 3 hours.

**478 Driver and Traffic Safety Education II.** Preparation of candidates for secondary school instruction in driver education. Classroom and in-car techniques of teaching beginning drivers. Range and simulator operation. Prerequisites: a good driving record and

ST 477. Lecture and laboratory. Credit, 3 hours.

**487 Organization and Administration of Driver and Safety Education.** Procedures and planning for the curriculum, organization, and administration of safety education programs. Prerequisite: ST 477. Credit, 3 hours.

**488 Transportation Safety Systems and Programs.** Survey of transportation systems, problems, issues, trends. Prerequisite: ST 477. Credit, 3 hours.

**489 Two-Wheeled Motor Vehicle Safety.** Purchase, maintenance, regulations and laws, protection, car-cycle conflicts, psychological implications of vehicle operation, range development and operation. Directed at the extension of knowledge of driver education teachers. Prerequisites: a good driving record and ST 478. Credit, 3 hours.

### ADULT EDUCATION

**AE 433 Family Education in the Schools.** Development, content and considerations of teaching marriage and family courses in the public schools. Prerequisite: approval of instructor. Credit, 3 hours.

**455 Education of Migrants.** Special problems and considerations in educating migrant families. Prerequisite: approval of instructor. Credit, 3 hours.

**511 Adult Education.** Historical development, objectives, scope, trends and significance of adult education. Philosophy and trends of adult education in relation to desirable present and future local public school programs. Credit, 3 hours.

**512 Curriculum Development and Program Planning in Adult Education.** Factors considered in establishing and developing an adult education program in secondary schools, colleges and universities. Prerequisite: AE 511. Credit, 3 hours.

**522 Educating the Middle-Age and Older Person.** Educational considerations and methods

utilized in each of the principal age groupings of adults. Prerequisite: approval of instructor. Credit, 3 hours.

**555 Inter-Cultural Education.** Administration and organization of inter-cultural education for interchanges and technical assistance of higher education in other countries. Credit, 3 hours.

**566 International Education.** Education in the world community with special reference to cross-cultural problems of foreign students preparing for teaching abroad. Credit, 3 hours.

**711 Adult Education.** Types, methods and administration of adult programs. Ways and means of implementing adult activity and to the use of adult activity in the study and improvement of educational services provided in local communities. Each student will participate in a research study of some area of adult education. Credit, 4 hours.

**Special Courses:** See pages 46-47.

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## Counselor Education

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### Professors:

DAVIS (ED B-401 A), BLACKHAM, BLAESSER, DAANE, DAVIS, HEIMANN, NICHOLS, RICHARDSON

**Clinical Associate Professor:**  
ABEYTA

**Associate Professors:**  
CABIANCA, CHRISTIANSEN, CUMMINGS, GUINOARD, HAMM, KIMLER, MAES, MCGREEVY, SNYDER

**Assistant Professors:**  
ANDERSON, CHURCHILL, GROSS, MAZEN, McWHIRTER, MILLER, RIPLEY, SHELL

**Visiting Professor:**  
WRENN

**CE 512 Principles of Counseling and Student Personnel Work.** Areas of student personnel