
Arizona State University

General Catalog 1981-82 | 1982-83

ASU BULLETIN



Arizona State University

General Catalog 1981-82/1982-83

All colleges and departments establish certain academic requirements which must be met before a degree is granted. These requirements concern such things as curricula and courses, majors and minors, and campus residence. Advisors, directors, department chairs and deans are available to help the student understand and arrange to meet these requirements, but the student is responsible for fulfilling them. At the end of a student's course of study, if requirements for graduation have not been satisfied, the degree will not be granted. For this reason it is important for all students to acquaint themselves with all regulations and to remain currently informed throughout their college careers and to be responsible for completing requirements. Courses, programs, and requirements described in the catalog may be suspended, deleted, restricted, supplemented or changed in any other manner at any time at the sole discretion of the University and the Arizona Board of Regents. The catalog does not establish a contractual relationship but it summarizes the total requirements which the student must presently meet before qualifying for a faculty recommendation to the Arizona Board of Regents to award a degree.

Requests for additional information should be addressed to

DIRECTOR OF ADMISSIONS
ARIZONA STATE UNIVERSITY
TEMPE, ARIZONA 85287

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

Arizona State University does not discriminate on the basis of sex, race, creed, color, age, handicapped or veteran status, or national origin in the education programs or activities which it operates, and is required by Title IX of the Education Amendments of 1972 and the regulations adopted pursuant thereto, Title VII of the Civil Rights Act of 1964, Section 503 of the Rehabilitation Act of 1973 and Section 402 of the Vietnam Era Veterans Readjustment Assistance Act of 1974, not to discriminate in such manner. The requirement not to discriminate in education programs and activities extends to employment therein and to admission thereto. Inquiries concerning the application of said Title IX and the published regulations to this University may be referred to the University's Affirmative Action Officer or the Director of the Office for Civil Rights of the Department of Health, Education and Welfare.

Arizona State University complies with the Family Educational Rights and Privacy Act of 1974 as amended (see page 14).

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Academic Organization

COLLEGE OF LIBERAL ARTS

Departments: Aerospace Studies; Anthropology; Botany and Microbiology; Chemistry; English; Foreign Languages; Geography; Geology; Health and Physical Education; History; Home Economics; Mathematics; Military Science; Philosophy and Humanities; Physics; Political Science; Psychology; Religious Studies; Sociology; Speech and Hearing Science; Zoology.

COLLEGE OF ARCHITECTURE

Departments: Architecture; Design Sciences; Planning.

COLLEGE OF BUSINESS ADMINISTRATION

Departments: Accounting; Administrative Services; Economics; Finance; Management; Marketing; Quantitative Systems; Center for Health Services Administration.

COLLEGE OF EDUCATION

Departments: Counselor Education; Educational Administration and Supervision; Educational Psychology; Educational Technology and Library Science; Elementary Education; Higher and Adult Education; Secondary Education; Special Education.

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

School of Engineering, Departments: Aerospace Engineering and Engineering Science; Chemical and Bio Engineering; Civil Engineering; Electrical and Computer Engineering; Industrial and Management Systems Engineering; Mechanical and Energy Systems Engineering.

Department of Computer Sciences.

Divisions of Agriculture, Construction and Technology.

COLLEGE OF FINE ARTS

Schools: Art, Music

Departments: Dance, Theatre.

COLLEGE OF LAW

COLLEGE OF NURSING

COLLEGE OF PUBLIC PROGRAMS

Departments: Communication; Journalism and Telecommunication; Leisure Studies; Center of Criminal Justice; Center for Public Affairs.

SCHOOL OF SOCIAL WORK

GRADUATE COLLEGE

CONTINUING EDUCATION AND SUMMER SESSIONS

University Calendar

Fall Semester	1981	1982
Priority Date for Receipt of Undergraduate Admissions or Readmission Credentials	Aug. 3, M	Aug. 2, M
First Freshman Assembly	Aug. 17, M	Aug. 16, M
Orientation and Advisement for New Students	Aug. 17-20, M-Th	Aug. 16-19, M-Th
Registration and Fee Payment	Aug. 19-20, W-Th	Aug. 18-19, W-Th
Instruction Begins	Aug. 24, M	Aug. 23, M
Late Registration and Drop/Add	Aug. 26-27, W-Th	Aug. 25-26, W-Th
Labor Day—Classes Excused	Sep. 7, M	Sep. 6, M
Last Day To Withdraw from a Course Without Academic Penalty	Oct. 2, F	Oct. 1, F
Mid-Semester Scholarship Reports Due in Office of Registrar	Oct. 16, F	Oct. 15, F
Candidates for Bachelor's Degree Must File Application for Graduation by	Oct. 16, F	Oct. 15, F
Veterans Day—Classes Excused	Nov. 11, W	Nov. 11, Th
Thanksgiving Recess—Classes Excused	Nov. 26-29, Th-Su	Nov. 25-28, Th-Su
Last Day To Withdraw from a Course	Dec. 3, Th	Dec. 2, Th
Instruction Ends	Dec. 10, Th	Dec. 9, Th
Reading Day	Dec. 11, F	Dec. 10, F
Final Examinations	Dec. 14-18, M-F	Dec. 13-17, M-F
Mid-Year Recess Begins	Dec. 19, Sa	Dec. 18, Sa

Spring Semester	1982	1983
Priority Date for Receipt of Undergraduate Admissions or Readmission Credentials	Dec. 18, F (1981)	Dec. 17, F (1982)
Orientation and Advisement for New Students	Jan. 11-13, M-W	Jan. 10-12, M-W
Registration and Fee Payment	Jan. 12-13, T-W	Jan. 11-12, T-W
Instruction Begins	Jan. 14, Th	Jan. 13, Th
Late Registration and Drop/Add	Jan. 20-21, W-Th	Jan. 19-20, W-Th
Candidates for Bachelor's Degree Must File Application for Graduation by Washington's Birthday—Classes Excused	Feb. 12, F	Feb. 11, F
Last Day To Withdraw from a Course Without Academic Penalty	Feb. 15, M	Feb. 21, M
Mid-Semester Scholarship Reports Due in Office of Registrar	Feb. 24, W	Feb. 23, W
Spring Recess—Classes Excused	Mar. 5, F	Mar. 4, F
Last Day To Withdraw from a Course	Mar. 13-21, Sa-Su	Mar. 12-20, Sa-Su
Instruction Ends	Apr. 29, Th	Apr. 28, Th
Reading Day	May 5, W	May 4, W
Final Examinations	May 6, Th	May 5, Th
Commencement	May 7, 10-13, F,M-th	May 6, 9-12, F,M-Th
	May 14, F	May 13, F
Summer Sessions	1982	1983
First Five-Week Registration	June 1, T	May 31, T
Instruction Begins	June 2, W	June 1, W
First Five-Week Session Ends	July 2, F	July 1, F
Second Five-Week Registration	July 6, T	July 5, T
Instruction Begins	July 7, W	July 6, W
Second Five-Week Session Ends	Aug. 6, F	Aug. 5, F
Eight-Week Registration	June 1, T	May 31, T
Instruction Begins	June 2, W	June 1, W
Eight-Week Session Ends	July 23, F	July 22, F

1981

JULY							AUGUST							SEPTEMBER						
SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4							1			1	2	3	4	5
5	6	7	8	9	10	11	2	3	4	5	6	7	8	6	7	8	9	10	11	12
12	13	14	15	16	17	18	9	10	11	12	13	14	15	13	14	15	16	17	18	19
19	20	21	22	23	24	25	16	17	18	19	20	21	22	20	21	22	23	24	25	26
26	27	28	29	30	31		23	24	25	26	27	28	29	27	28	29	30			
							30	31												

OCTOBER							NOVEMBER							DECEMBER						
SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3										1	2	3	4	5
4	5	6	7	8	9	10	8	9	10	11	12	13	14	6	7	8	9	10	11	12
11	12	13	14	15	16	17	15	16	17	18	19	20	21	13	14	15	16	17	18	19
18	19	20	21	22	23	24	22	23	24	25	26	27	28	20	21	22	23	24	25	26
25	26	27	28	29	30	31	29	30						27	28	29	30	31		

1982

JANUARY							FEBRUARY							MARCH							
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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3	4	5	6	7	8	9	7	8	9	10	11	12	13	7	8	9	10	11	12	13	
10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20	
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27	
24	25	26	27	28	29	30	28							28	29	30	31				
31																					

APRIL							MAY							JUNE						
SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3										1	2	3	4	5
4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
25	26	27	28	29	30	31	23	24	25	26	27	28	29	27	28	29	30	31		

1983

JULY							AUGUST							SEPTEMBER						
SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT
					1	2										1	2	3	4	5
4	5	6	7	8	9	10	1	2	3	4	5	6	7	6	7	8	9	10	11	12
11	12	13	14	15	16	17	8	9	10	11	12	13	14	13	14	15	16	17	18	19
18	19	20	21	22	23	24	15	16	17	18	19	20	21	20	21	22	23	24	25	26
25	26	27	28	29	30	31	22	23	24	25	26	27	28	27	28	29	30	31		



Organization, History, General Information

Objectives

Arizona State University provides an opportunity for students to pursue a full range of high-quality academic programs, from the baccalaureate through the doctoral degree. Active research programs contribute to and expand knowledge, thereby serving the instructional needs of students, contributing to the professional advancement of the faculty, and enhancing economic, social, cultural, and technological progress. The University's teaching and research programs help instill in students a spirit of critical inquiry and challenge them to seek answers to fundamental questions of human concern. The University seeks to expand cultural horizons, improve moral and ethical standards, and educate for responsible citizenship while preparing its graduates to accept and perform capably in rewarding careers.

Organization

Arizona State University is part of a three-university system 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, and one non-voting student regent serving for one year, with the elected Governor and State Superintendent of Public Instruction as members *ex officio*.

The Regents select and appoint the President of the University, 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 the

Provost, Vice Presidents, Deans, Directors, Departmental Chairs, Faculties, and other officers.

In the University's academic organization are the Colleges of Liberal Arts, Architecture, Business Administration, Education, Engineering and Applied Sciences, Fine Arts, Law, Nursing, Public Programs; School of Social Work, Graduate College; University Continuing Education and Summer Sessions; and more than 50 units of instruction. These academic agencies develop and effectuate the teaching, research and service programs of the University, aided by the University libraries, museums, and other services.

The faculties and students of the University play an important role in educational policy, with a Faculty Senate, joint University committees and boards, and the Associated Students serving the needs of a large institution. A comprehensive system of joint faculty, student, alumni and staff committees provides an exchange of ideas and collaboration on the part of all members of the University.

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—thereby founding 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 Principal 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 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 areas, the school has carried forward this charter, accompanied by successive changes in scope, name and governance. 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 following national bodies:

Architecture: National Architectural Accrediting Board, American Institute of Planners, Foundation of Interior Design Education and Research, Industrial Design Society of America, American Society of Landscape Architects; **Business Administration:** American Assembly of Collegiate Schools of Business, Accrediting Commission on Education for Health Services Administration; **Education:** American Psychological Association, National Council for the Accreditation of Teacher Education, State Board of Education (Arizona);

Engineering and Applied Sciences: American Council for Construction Engineers, North Central Association for Teacher Education (through Secondary Education Department), Accreditation Board for Engineering and Technology, Inc., National Association of Industrial Technology; **Fine Arts:** National Association of Schools of Music; **Law:** American Bar Association, Association of American Law Schools;

Liberal Arts: American Chemical Society, American Speech and Hearing Association, American Psychological Association, National Athletic Trainers Association; **Nursing:** The National League of Nursing, American Nurses Association, Arizona State Board of

Nursing; **Public Programs:** American Council on Education in Journalism; **Social Work:** The Council on Social Work Education.

University Campus

Location. Arizona State University is located near the heart of metropolitan Phoenix, in the city of Tempe (population 116,000). Nearby are the municipalities comprising the fast-growing Valley of the Sun — Scottsdale, Mesa, Chandler, Glendale and other communities.

Main Campus-Tempe: The main campus comprises some 600 acres and offers outstanding physical facilities to support the University's educational programs. Buildings are modern, air-conditioned, and designed for function and attractiveness. Broad pedestrian malls laid out in an easy-to-follow grid plan, bicycle lanes connecting all parts of the University, and spacious lawns and sub-tropical landscaping characterize a campus serving the physical, esthetic, and educational needs of students, faculty, and staff.

ASU-Metrocenter: Serving the needs of students in the northwest Phoenix and Glendale areas, the Metrocenter facility is located just off Interstate 17 between Peoria and Dunlap Avenues in the southwest area of the Metrocenter complex. It provides classrooms, computer terminals, and a lounge-study area with an extensive schedule of upper-division and graduate courses.

ASU-Alhambra: The Alhambra complex includes a minicampus of classrooms, lounge, reference library, and offices located at 4510 North 37th Avenue in the north Phoenix area. Upper-division and graduate courses are offered for northern metropolitan area students.

Center for Executive Development Annex: The Center operates an 8000 square foot conference center with seminar rooms and offices at 2200 South Priest Road, Tempe.

Louise Lincoln Kerr Cultural Center: Located in Scottsdale, the Center offers cultural events, especially in the performing arts, for the community.

Camp Tontozona. Located in the famed Mogollon Rim country near Kohl's Ranch northeast of Payson, this continuing education facility of the University serves the needs of academic departments conducting teaching and research in mountain terrain.

12 GENERAL INFORMATION

Conference Center at Castle Hot Springs.

The Center, consisting of 165 acres northwest of Lake Pleasant, features lodging and meal accommodations for participants in University-sponsored conferences. The facility was deeded to the Arizona State University Foundation and is scheduled and administered through the Office of University Continuing Education.

University Libraries and Collections

The collections of the University's libraries comprise more than 2 million volumes, approximately 1.5 million microform units and more than 18,000 periodical and serial subscriptions. Computer access to commercially produced bibliographic data bases and the ability to borrow research materials from other libraries enhance local resources.

Charles Trumbull Hayden Library. The main library houses the largest multidisciplinary collection. In addition to the open stack areas, separate collections and service areas include Curriculum, Government Documents, Interlibrary Loan, Microforms, Reference, Reserve, Unbound Journals, Rare Books, and the Arizona Collection, including the papers of several major Arizona political figures. Science Reference and Map Service are also located in the main library, but will be moved to the Science Library when it opens in 1982.

Architecture Library. In addition to books and periodicals, this library, located in the College of Architecture, contains the Paolo Soleri archives.

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.

Bimson Library. Located in the College of Business Administration, Bimson Library houses a small collection of ready-reference materials and current periodicals. The bulk of the library's holdings in all areas of business and economics is found in Hayden Library.

Law Library. This comprehensive collection of legal materials is located in the John S. Armstrong Law Building.

Music Library. A large collection of music scores, recordings and music reference materials, plus listening facilities for individuals and groups, is located on the third floor of the Music Building. Special collections include the Wayne King Collection, the Pablo Casals In-

ternational Cello Library and the International Percussion Reference Library.

Daniel E. Noble Science Library. Scheduled to open in the spring of 1982, this major branch library will house books, journals, and microforms in the sciences and geography, the Solar Energy Collection, and the Map Collection.

University Archives. The records of the University, its official publications and publications of its faculty, students and staff are preserved in this collection.

Cultural Arts Resources

Gammage Center for the Performing Arts is housed in Grady Gammage Memorial Auditorium, designed by Frank Lloyd Wright and 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, Edward Jacobson, and Mr. and Mrs. Joseph Thomas are shown periodically. Special showings of significant traveling exhibitions are scheduled throughout the year.

Harry Wood Gallery. Housed in the Art Building (Room 120), the Gallery provides year-round, temporary exhibitions of the visual arts.

Northlight Gallery. This facility is dedicated to qualitative exhibitions of the art of photography and is located in the Fine Arts annex (Room 116).

Laura Boulton Collection of World Music and Musical Instruments. Housed in the Music Building, the collection includes aboriginal and folk music and instruments.

Television Station KAET. KAET, Channel 8, Phoenix, is licensed and owned by the Arizona Board of Regents and operated by Arizona State University. Studios of the

award-winning station are located in the Stauffer Communication Arts Building. The station is affiliated with Public Broadcasting Service (PBS), and broadcasts daily from 7 a.m. to midnight. Program information is available from the KAET program manager.



Undergraduate Program

Arizona State University shares with other colleges and universities a tradition that is hundreds of years old. Its purpose is the exchange of knowledge and the pursuit of wisdom. What makes a university special is that it provides a place where the teacher and student are encouraged to exchange ideas and information within an atmosphere of intellectual honesty.

All persons who can give evidence—usually by way of acceptable academic credentials—of suitable preparation are welcome at the University, without regard to race, skin color, religious creed, or national origin. Remaining in good standing in the University community, however, becomes a privilege and not a right, since the student by enrolling assumes certain obligations of conduct and performance. These have been set up by the University in order to enable it to function effectively.

Under the Constitution and the laws of the State of Arizona, jurisdiction and control over Arizona State University have been vested in the Arizona Board of Regents. The Regents in turn grant broad legal authority to the President, the administration, and the faculty to regulate student life, within reasonable limits.

As a voluntary community, the University prefers to develop responsible student citizenship by example and advice. Yet there may be times when students, individually or in groups, choose to conduct themselves in ways that injure the effective operation of the University or prove harmful to its good name. Such students may be summoned to appear before the University Trial Board, a standing committee of students and teaching faculty to determine whether the defined standards of conduct have been violated.

The University has a concern for student conduct on the campus as well as at various events and functions off-campus which are sponsored by the University.

Students are expected, as part of their obligations, to be familiar with the *Code of Conduct*. Violations of this *Code of Conduct* are subject to University discipline, whether committed by individuals or groups. This is also true of violation of University regulations with regard to academic dishonesty, specifically cheating in examinations, laboratory work, written work (plagiarism), forging, or altering University records—that is, attempting to gain credit for work which the student has not actually performed.

Family Educational Rights and Privacy Act of 1974 (Buckley Amendment)

Eligible students may inspect and review their education records. Certain records may remain confidential if the student waives the right of inspection. Waivers signed may be revoked at any time by an eligible student. The subsequent access applies only to those confidential statements and records placed in the file after the date of revocation.

Definitions

Eligible Student. For the purposes of this Act, an *eligible student* is defined as any individual formally admitted to and enrolled at Arizona State University or the parents of a *dependent* eligible student. Dependency is defined by Section 152 of the Internal Revenue Code of 1954. This policy does *not*, however, apply to persons who applied for admission to the University, but have not been officially admitted.

Students must declare at registration their dependent status and individuals to whom information may be released.

Education Records. Education records are records (1) directly related to a student, and (2) maintained by the University or by a party acting for the University. The term does not include those records specifically excluded by Section 99.3 of the Privacy Act.

Directory Information. Certain information may be published, either in a campus directory, or in programs for University events. Such information includes the student's name, local or campus address, local telephone number, home or off-campus address, date and place of birth, citizenship, tuition and fee status, class level, major field of study, college of enrollment, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended by the student. Students have the right to request that the above information not be disclosed.

Personally Identifiable. Data included are (a) the name of a student, the student's parent, or other family member, (b) the address of the student, (c) a personal identifier, such as the student's Social Security number or student number, (d) a list of personal characteristics or, (e) other information which would make the student's identity easily traceable.

Record. Any information or data recorded in any medium, including, but not limited to: handwriting, print, tapes, film, microfilm, and microfiche.

Location of Policy and Records

The following school officials maintain educational records pertaining to students: Registrar; Comptroller; Dean of the Graduate College; Directors of Admissions, Career Services, Financial Aids, Housing, Special Services, and University Testing Service; Deans of the Colleges; Chairs of the Departments and Academic Advisors; Dean of Students; Interpatnational Student Adviser; NCAA Faculty Representative; Coordinators of Intramurals and Orientation. The complete policy and a list of the records on file and their location are available at the Reserve Book Desk, Level I, Hayden Library.

Access to Records

All eligible students will have access to records as prescribed by the Privacy Act.

Personally identifiable information may be disclosed to parents of those students who report *dependency status* at registration. Based on that report, the University either will or will not make records available to parents. These forms will be retained by the Registrar's office.

Parents may challenge a student's report by producing the most current copy of their Internal Revenue Form 1040. If that form lists the student in question as a dependent, the parents will be required to sign an affidavit which affirms that the student is their dependent. The affidavit will be retained by the Registrar's Office. Upon receipt of the affidavit, the University will make student records available to parents as specified under the Privacy Act.

Proof of Identification. Before access is allowed to educational records, the student must display some form of personal identification. At the minimum this identification should include a picture of the student.

Copies of Student-Related Records. One copy of student-related materials to which a student has not waived rights of access may be provided to the student upon written request to the University official responsible for that record.



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Degree Programs Currently Offered at ASU

Programs Leading to the Bachelor's Degree

Accounting	Environmental Resources	Microbiology
Administrative Services	in Agriculture	Music
Advertising	Finance	Music Therapy
Aerospace Engineering	French	Nursing
Agribusiness	General Business Administration	Performance (Music)
Anthropology	General Science	Philosophy
Architecture	Geography	Physical Education
Art	Geology	Physics
Asian Languages	German	Political Science
Biology	Health Science	Psychology
Botany	History	Quantitative Business Analysis
Broadcasting	Home Economics	Radiology
Chemical Engineering	Housing and Urban	Real Estate
Chemistry	Development	Recreation
Choral (Music) - General	Humanities	Religious Studies
Civil Engineering	Industrial Design	Russian
Communication	Industrial Engineering	Secondary Education
Communication Arts	Industrial Vocational Education	Selected Studies in Education
Computer Information Systems	Industrial Technology	Social Work
Computer Science	Instrumental Music	Sociology
Construction	Insurance	Spanish
Criminal Justice	Interdisciplinary Programs	Special Education
Dance	(Engineering)	Special Programs (Engineering)
Design Science	Interior Architecture	Speech and Hearing Sciences
Economics	Journalism	Theatre
Electrical Engineering	Management	Theory and Composition (Music)
Elementary Education	Marketing	Transportation
Engineering Science	Mathematics	Urban Planning
Engineering Technology	Mechanical Engineering	Wildlife Biology
English	Medical Technology	Zoology
Entomology		

Programs Leading to the Master's Degree

Accounting	Economics	History
Agribusiness	Educational Administration	Home Economics
Anthropology	and Supervision	Humanities
Art	Educational Media	Industrial Engineering
Biological Sciences	Educational Psychology	Instrumental Music
Botany	Educational Technology	Mathematics
Business Administration	Electrical Engineering	Mechanical Engineering
Chemical Engineering	Elementary Education	Microbiology
Chemistry	Engineering Science	Music History and Literature
Child Drama	English	Natural Sciences
Choral Music	Environmental Resources in	Nursing
Civil Engineering	Agriculture	Performance (Music)
Communication	Environmental Planning	Philosophy
Communication Disorders	French	Physical Education
Community Education	Geography	Physics
Computer Science	Geology	Political Science
Counseling	German	Psychology
Counselor Education	Health Services Administration	Public Administration
Criminal Justice	Higher and Adult Education	Recreation
Dance		Religious Studies

Programs Leading to the Master's Degree (Cont'd)

School Library Science	Social Work	Technology
Secondary Education	Sociology	Theatre
Social and Philosophical Foundations (Education)	Spanish	Theory and Composition (Music)
	Special Education	Zoology

Programs Leading to the Education Specialist Degree

Counselor Education	Elementary Education	Secondary Education
Educational Administration and Supervision	Higher and Adult Education	

Programs Leading to the Doctoral Degree

Anthropology	Electrical Engineering	Microbiology
Botany	Elementary Education	Physics
Business Administration	Engineering Science	Political Science
Chemical Engineering	English	Psychology
Chemistry	Geography	Public Administration
Choral Music	Geology	Secondary Education
Civil Engineering	Higher and Adult Education	Social and Philosophical Foundations (Education)
Counselor Education	History	Sociology
Economics	Industrial Engineering	Solo Performance (Music)
Educational Administration and Supervision	Instrumental Music	Spanish
Educational Psychology	Law	Special Education
Educational Technology	Mathematics	Zoology
	Mechanical Engineering	

Undergraduate Admission

Arizona State University welcomes application for admission from all persons who feel they can qualify for admission and can benefit from the University's broad spectrum of educational programs and services.

Persons interested in applying for admission to Arizona State University may write to the Admissions Office for information.

Prospective students who want to visit the campus may call (602/965-7788) or write to the Admissions Office (136 Moeur Building) for information including application materials. With reasonable advance notice, the Admissions Office will arrange for a tour of the campus and, if desired, a meeting with an academic advisor in the applicant's field of interest. (These are listed on page 16 of this catalog.)

Requests for specific information relating to academic programs or student services should be addressed to the appropriate department, division or college.

University orientation programs for new students and their parents are provided at numerous times during the year including the beginning of each semester. Each orientation program includes advisement, placement test-

ing, campus tours, tuberculin skin tests, special events, and an introduction to University resources and procedures. Newly admitted students will be sent information preceding each available orientation program. Students are not required by University regulations to attend orientation activities, but participation is strongly recommended. The directors of the activities are themselves former ASU students and they can offer much helpful advice.

Admissions Procedures for New Freshman and Transfer Applicants

Persons interested in admission to an undergraduate program at Arizona State University will need to have the following items on file in the Admissions Office: 1) Application for Admission (including Domicile Affidavit); 2) official transcript(s); 3) American College Test (ACT) or Scholastic Aptitude Test (SAT) scores (as needed); and 4) the \$10 application fee (for applicants residing out of the State of Arizona only). Applicants are urged to send their materials as soon as possible. This will enable the University officials to make an early decision concerning the applicant's admission and permit the student to take part in early registration and orientation.

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Priority deadlines are listed in the University Calendar (page 6). Applications received after those dates may not be honored for the semester desired. A completed application for admission is valid only for the semester for which admission is requested.

Application. Prospective students must submit a completed and signed application on the official application form to the Admissions Office. All applicants for undergraduate admission residing out of the State of Arizona pay a nonrefundable application fee of \$10 at the time application for admission is made.

Domicile Affidavit. Like other state-supported colleges and universities, Arizona State University distinguishes between in-state and out-of-state students with regard to tuition. Bona fide residents of Arizona are required to file a Domicile Affidavit with the Admissions Office. Students who neglect to do so will be assessed out-of-state tuition and fees. If there is any question or doubt, the student should consult the Fee Status Officer, 124 Physical Education Building West, or call 602/965-7712.

Transcripts. Official transcripts of academic records from high school as well as any other institution of higher education the student has previously attended must be *mailed directly* to the Admissions Office by the records office of the issuing institutions. Transcripts sent in or hand-carried by the applicants themselves will not be accepted. High school transcripts must show grade point average, rank in class, and date of graduation. The applicant is responsible for requesting that transcripts be sent. Applicants with 24 hours or less of transferable credit must also have official high school records submitted.

Entrance Examinations. All new freshman applicants must take either the American College Test (ACT) or Scholastic Aptitude Test (SAT) on a national test date in their junior or senior year of high school. Applicants for transfer who have not completed at least 9 semester hours of acceptable work with a grade point average of 2.00 or better on a 4.00 = A scale must submit either ACT or SAT scores.

A report of the test scores must be sent to the Admissions Office directly from the American College Testing Program, P. O. Box 168, Iowa City, Iowa 52240, or The College Board Admissions Testing Program, Box 592-R, Princeton, NJ 08540.

Health History Questionnaire. Every newly admitted student must complete the Arizona State University Health History Questionnaire for the Student Health Service. Before becoming enrolled, each student must have a free tuberculin skin test at the Student Health Service. Admission may be denied or cancelled for any applicant who has been shown by the University to have either an uncompensated psychiatric illness or a physical illness which can be hazardous to the safety of other persons.

Undergraduate Admission Standards

The Arizona Board of Regents establishes undergraduate admission standards for the University in general. *Particular colleges, schools, or departments within the University may establish stricter standards. These are given in the respective sections of the Catalog and should be noted by students planning to enroll in any of these programs.*

Admission Requirements for Entering Freshmen: Academic

Graduation from Secondary School. In order to be eligible for admission to Arizona State University, an applicant must have graduated from a recognized high school with a satisfactory scholarship defined as follows:

1. Rank in the upper 50% of the high school graduating class, OR,
2. Achieve a minimum composite ACT score of 21 (in-state applicants) or 23 (out-of-state applicants), OR,
3. Achieve a minimum composite SAT score of 930 (in-state applicants) or 1010 (out-of-state applicants).

If the applicant is unable to meet these specific admission requirements, it is possible to file a letter of appeal with the University Undergraduate Admissions Board, 136 Moer Bldg., Arizona State University, Tempe, AZ 85287. The applicant must be able to meet at least one of the following criteria:

1. A high school grade point average of 2.50 or higher on a 4.00 = A scale.
2. An upward grade trend during the high school career, or an upward grade trend during the senior year.
3. Positive recommendations from secondary school administrators, faculty, or counselors based on considerations such as

academic potential, work experience, leadership ability, or extracurricular activities.

4. An average score on the General Education Development (GED) test of 55 or greater.
5. Demonstration of the ability to complete college freshman level academic studies with a grade point average of 2.00 or higher on a 4.00 = A scale in courses in English, social science, mathematics, physical or natural science, foreign languages, fine arts, or the humanities. The applicant must have earned at least 9 credit hours at a community college or summer or evening sessions at a university, or both.

Classification of Secondary School Subjects

- Group I English. Courses with major emphasis upon grammar, composition, and literary analysis.
- Group II Foreign Languages. Classical or modern foreign language. Two units or more are 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, communication, economics, sociology, geography, and government (including United States and Arizona Constitution).
- Group V Laboratory Sciences. 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, communication and drama, and humanities.
- Group VII Agriculture, bookkeeping, general science, home economics, arithmetic, general mathematics, journalism, industrial arts, secretarial training, physical education, military science, and other subjects commonly offered for credit by secondary schools.

Recommended Secondary School Subject Units. The following recommended pattern of subjects is that which, on the basis of experience, can be reasonably 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 (from Group I)	4
or English 3 and one Foreign Language 2 (from Groups I and II)	or 5
Mathematics (from Group III)	2
American History and Social Studies (from Group IV)	2
Laboratory Science (from Group V)	2
Electives (from Groups I through VII)	6
depending upon English option	or 5
	16 or more

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

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

Conditional Admission Prior to Graduation from High School. Conditional admission may be granted to high school seniors who submit a six-semester or seven-semester transcript which shows academic quality and rank in class in keeping with admission standards, and who complete the steps in the undergraduate admission procedures. Regular admission will be confirmed when a verification of the high school graduation showing final grade point average, rank in class and date of graduation has been received in the mail by the Admissions Office directly from the high school. The conditional admission may be cancelled if the final verification shows that the applicant has not met the University requirements for admission.

Admission with Distinction. Admission with Distinction certificates recognizing outstanding scholarship are awarded to entering freshmen who rank in the top 10% of their high school graduating classes. This designa-

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tion is honorary in nature and does not include a financial award.

Able and Ambitious Program. The high school senior with only a limited amount of work remaining for completion of high school graduation, who ranks in the top 10% of the class, may be granted *special enrollment* as an unclassified student to enroll for a *maximum of six hours per semester* at the University. To qualify, the following conditions must be met:

1. An application for the Able and Ambitious Program must be submitted to the Admissions Office. Applicants sign an agreement that they will continue in high school while enrolled at Arizona State University and that they will graduate with their high school class.
2. An official transcript of the high school record showing senior standing and rank (top 10%) in class must be sent directly to the Admissions Office by the high school.
3. The principal or counselor of the high school must send a written recommendation to the Admissions Office authorizing the enrollment of the high school senior at Arizona State University at the same time the student is completing the high school program.

Admission of Unclassified Applicants

—Undergraduate. Any person 19 years of age or older may enroll for six semester hours or less per semester of undergraduate course work as an unclassified student. Such a student is not required to file a transcript or domicile affidavit. It will be necessary, however, to file an Unclassified Student Admission form. An unclassified student cannot be a candidate for any University degree. Persons disqualified or otherwise not eligible for regular admission will not be permitted to attend as unclassified students.

An unclassified student who decides to work toward a bachelor's degree will have to *apply for admission to a degree program* with the Admissions Office, and meet all the admission requirements that apply to degree-seeking students at the time of application. No more than 15 hours of completed unclassified work may be applied to a degree program, if the completed courses meet specific requirements within a degree program.

Once registered in a regular degree program, a student will not be permitted to register again in unclassified status.

Transfer Applicants

An applicant for transfer admission must have a grade point average of 2.00 or higher (see specific college requirements) on a 4.00 = A scale in all work undertaken at previous institutions of higher learning, and at the same time must be in good standing and eligible to return to such institutions. (International applicants should see requirements on page 21.) Applicants with less than 12 semester hours of completed transferable work will follow the procedures for entering freshmen, as outlined on page 17. Applicants with 24 hours or less of transferable work must submit official high school records.

Transfer Credit

Credit will be awarded for traditional course work successfully completed at institutions of higher learning as indicated by Arizona State University and the Board of Regents. Whether the specific credits can be applied toward a degree depends on the requirements of the department, division, or college in which the student is enrolled. There are several qualifications: (1) Transfer credit is not given for courses in which the lowest passing grade (D) was received. (2) While courses successfully completed but evaluated on nontraditional grading systems (e.g. pass-fail) are acceptable for transfer, some colleges in the University may not accept such credits to fulfill graduation requirements. (3) Credit granted for "life experience" by the institution previously attended cannot ordinarily be transferred. (4) Grades and honor points earned at other colleges and universities are considered for admission, but are not included in computing the student's cumulative grade point average at Arizona State University.

Veterans Exception. By Arizona statute, in determining the admissibility to the University of a veteran, honorably discharged, who has served in the Armed Forces of the United States for a minimum of two years, who has previously enrolled at a university or community college in Arizona, no failing grades received by such veteran at an Arizona university or community college prior to military service may be considered. Military service records must be submitted, including form D D 214.

Community Colleges. A maximum of 64 semester hours of credits will be accepted as lower division credit when transferred from community, junior, or two-year colleges.

Community college students who plan to transfer to Arizona State University at the end of their first or second year are strongly advised to plan their community college courses to meet the requirements of the curriculum they select.

Students Attending Other Arizona Colleges and Universities.

To determine the equivalency of courses between Arizona institutions and those offered at Arizona State University, students should consult, with their academic advisor, the "Arizona Higher Education Course Equivalency Guide." Provided their college attendance has been continuous, students will be permitted to follow the degree requirements specified in the Arizona State University catalog in effect at the time they began their community college work. (See page 40.)

Conditional Admission Prior to Receipt of Final Transcript. Students enrolled in other colleges and universities will be considered for conditional admission on the basis of meeting all admission requirements, except for a final transcript of work in progress. This final transcript must be sent to the Admissions Office from the issuing institution immediately after the work in progress has been completed. Hand-carried transcripts will not be accepted. *Admission will be confirmed only after the final transcript has been received, showing that the applicant has met the University admission requirements.* In the event the applicant does not qualify, admission and registration will be cancelled, and any registration fees paid will be returned.

Appeal Procedure. Transfer students who feel they have been unjustly denied credit for courses they have taken may appeal to the standards committee of the college in which they have enrolled. (This does not apply to community college transfer of credit over the 64-hour maximum, see above.) The decision of this committee is final.

Applicants for transfer admission whose academic record fails to meet Arizona State University scholarship admission standards or who have been disqualified because of deficient scholarship, conduct, or other reasons by the college or university previously attended, will be denied admission. Such applicants, however, may write a letter of appeal to the University Undergraduate Admissions Board for reconsideration of their applications. The decision of this Board is final.

Admission of Disabled Applicants. Academically qualified disabled persons are encouraged to apply for admission to Arizona State University.

A pre-admission inquiry may be made by the Office for Disabled Student Services, in order to better assist the incoming student with the appropriate support services. The inquiry will be made on a confidential basis, in an effort to take remedial action, in meeting the individual applicant's needs. This is a voluntary action by the University. Refusal to provide such information will have no bearing on the applicant's admission or treatment at Arizona State University.

Before the beginning of the academic term the student must arrange for attendant care and other personal assistance, if so advised by a physician. The student has the sole responsibility of arranging for personal care assistance.

Auxiliary aids related to educational programs and activities may be provided by the Office for Disabled Student Services.

To ensure a smoother transition into the University community, all prospective disabled students are urged to contact the Office for Disabled Student Services at: Student Health Services Building, Room 177, Arizona State University, Tempe, Arizona 85287. Telephone: 602/965-6482 (TTY at same number).

Undergraduate Admission of International Applicants

For admission purposes, international applicants are defined as all persons who are not citizens of the United States of America.

All international applicants seeking admission to Arizona State University, in addition to meeting the standards for undergraduate admission, either as freshman or transfer applicants, must fulfill the following requirements:

- 1) Meet admissions requirements.

Freshmen: Must have equivalent academic level and rank as required for admission of United States' citizens.

Transfer (12 credit hours or more): Must have a cumulative grade point average of 2.50 or higher on a 4.00 = A scale in all work undertaken at the previous institution of higher learning and at the same time be in good standing and eligible to return to such institution(s).

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- 2) Demonstrate proficiency in the English language. The University requires all international applicants whose native language is not English to take the Test of English as a Foreign Language (TOEFL). A minimum passing score of 500 is required for admission.

The scores must be submitted directly to the Admissions Office from TOEFL, Box 899, Princeton, New Jersey 08540.

Applicants who have completed the program in Arizona State University's English Skills Program may demonstrate proficiency in English by passing the battery of examinations required for issuance of the Advanced Proficiency Report in lieu of passing the TOEFL.

- 3) Provide a personal data sheet certifying that they possess adequate financial resources to support themselves while in residence at the University. International applicants on scholarship must provide a letter of financial responsibility from the sponsoring agent or organization.
- 4) Meet all appropriate immigration standards and requirements.
- 5) Have all required admissions materials and credentials reach the Admissions Office at least two months prior to the beginning of the semester for which application is being made.

International Student Information

- 1) Upon admission to the University, international students are issued a Certificate of Eligibility (Form I-20 or IAP-66) which enables them to apply for the appropriate visa.
- 2) All international students are required 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 may be obtained at the time of registration.
- 3) Upon arrival on campus, international students must report to the International Student Adviser.

English Skills Program. Arizona State University offers an intensive English training program for non-native speakers of English. Inquiries about the curriculum, fee schedule, etc., should be addressed to Dr. Denis J. Kigin, University Continuing Education, Arizona State University, Tempe, AZ 85287. Acceptance into the English Skills Program is separate from admission to the University.

Admission to Summer Sessions

Summer Sessions courses are equivalent in content, academic credit, and standards of performance to the regular semester courses. As a rule they are taught by regular members of the Arizona State University faculty. Persons enrolling in these courses must meet the University's admission and scholarship requirements, but they need not be formally admitted or readmitted to the University. On the other hand, attendance in Summer Sessions courses does not indicate that a person has been admitted or readmitted to a degree program at the University. A Summer Sessions schedule is published well in advance of the start of classes and may be obtained by writing or calling the Summer Sessions office. Only high school students who are approved for the Able and Ambitious Program may enroll for Summer Sessions.

Readmission to the University

If an undergraduate student has not been enrolled at Arizona State University for one semester or more, it will be necessary to apply for readmission for the semester that he or she intends to re-enroll. If meanwhile the student has attended an accredited college or university other than Arizona State University, it will be further necessary for the records office of such institution(s) to send an official transcript of all academic work taken to: Readmissions, Registrar's Office, Arizona State University. Failure to report such attendance is considered misrepresentation and falsification of university records. It is considered cause for "Records Hold" action and withholding further registration privileges.

An applicant for readmission, classified or unclassified, must meet the requirements for good standing (page 35). An applicant who has been denied readmission may appeal to the University Undergraduate Admissions Board.

Former students who have not attended the University for two years or more must take the tuberculin skin test and complete the Health History Questionnaire. Both are available at the Student Health Service.

Conditional Readmission. A student may be granted conditional readmission until the Registrar's Office has received official transcripts of academic work in progress at another institution. This condition for readmission must be cleared by mid-semester or the student will be subject to "Records Hold" action and additional registration privileges will be withheld.

Special Programs for Advanced Placement and Credit

(Maximum of 30 hours of credit awarded for any or all programs)

1) Advanced Placement. Students who have taken an advanced placement course of the College Entrance Examination Board (CEEB) in their secondary school, *and* who have taken an Advanced Placement Examination of CEEB may receive credit with a score of 5, 4 or 3. No credit will be given for any examination with a score of 2 or 1. Sophomore standing in a discipline or area will be awarded with a score of 5.

When the scores are received by the University directly from CEEB, credit will be awarded as follows:

Exam	Score	Credit Hours
Art-History	5 or 4	6 (ARH 101 and 102)
	3	3 (ARH 101 or 102)
Biology	5 or 4	8 (BIO 101 and 102)
	3	4 (BIO 101)
Chemistry	5 or 4	7 (CHM 113 and 115)
	3	4 (CHM 113)
English	5 or 4	6 (ENG 101 and 102; exempt from ENG 104)
	3	Department will evaluate examination and recommend
Classics (Vergil, Lyric, Prose)	To be evaluated upon receipt	
French, German or Spanish—Language	5,4,3	8-14 (FRE, GER or SPA 201 and 202; additional credit to be recommended by the department)
French, German or Spanish—Literature	5,4 or 3	8-14 (FRE, GER or SPA 201 and 202; additional credit to be recommended by the department)
History-American or European	5 or 4	6 (HIS 103 and 104 or 101 and 102)
	3	Department will evaluate examination and recommend
Mathematics-Calculus AB	5 or 4	4 (MAT 270)
	3	4 (MAT 270)
Mathematics-Calculus BC	Same as for Calculus AB; upon Departmental approval, credit may be granted for MAT 271 as well with a 5 or 4.	
Physics B	5 or 4	6 (PHY 111 and 112)
	3	3 (PHY 111)
Physics C	Same as for Physics B; or upon Departmental approval, credit may be granted for PHY 115 and 116 instead with a 5 or 4 score, or PHY 115 with a score of 3	

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2) College-Level Examination Program (CLEP). Students who have taken a College-Level Examination of the College Entrance Examination Board may receive University credit. The following table of credit applies to all students enrolling in the University for the first time in August 1975 and any student enrolling thereafter. CLEP examination credit will *not* be given where (a) it duplicates credit previously earned by the student at the University or accepted by the University for work done elsewhere, or (b) it is more elementary than a course in which the student has already received credit. All examinations are given monthly by the University Testing Service.

General Examinations: To obtain credit or placement, students must receive a standard score of 500 or higher for the General Examinations, except for English Composition which requires a standard score of 610. *Students who have completed 60 semester hours of credit are not eligible to receive any credit for the CLEP General Examinations.*

Subject Examinations: A standard score of 50 or higher must be received to obtain credit for any subject examination. The 60-semester-hours-of-credit limitation does not apply to subject examinations.

General Examinations	Credit Hours	Equivalency
English Composition	None	With essay exempts ENG 101 and 102 to enter ENG 104 but without essay see English Composition subject exam or English Placement Examination
Humanities	6	General Studies Credit
Mathematics	3	MAT 106
Natural Sciences	8	General Studies or Major Credit
Social Science	6	Elective Credit
Subject Examinations	Credit Hours	Equivalency
Accounting	6	ACC 101 and 102
American Government	3	POS 300*
American History (6)		
Early Colonization to 1877	3	HIS 103
1865 to the Present	3	HIS 104
American Literature (6)		
I, Colonial Period to 1870	3	ENG 341
II, 1870 to the Present	3	ENG 342
Analysis and Interpretation of Literature	3	General Studies (no credit if English major)
Biology	4	General Studies or major elective
Clinical Chemistry	None**	Petition Botany/Microbiology Dept. if transfer from an Arizona community college
College Algebra	3	MAT 117
College Algebra and Trigonometry	4	MAT 115
Computers and Data Processing	3	Elective Only
Intro. Macroeconomics	3	ECN 201 (Dept. will accept credit
Intro. Microeconomics	3	ECN 202 for 201 or 202—not both) No credit or advanced placement if major is Economics or any major in College of Business Administration.

Educational Psychology	3	EDP 310*
English Composition	None	With essay exempts ENG 101 and 102 to enter ENG 104
English Literature	3	General Studies (Seniors may use ENG 221 or 222)
Freshman English	None	Recommend English Composition Subject Exam
Foreign Languages (College French, College Spanish)	0	Placement at Foreign Language level.
Fortran IV	2	ECE 122 <i>or</i> ASE 226 <i>or</i> ASE 321
General Chemistry	7	CHM 113 and 115
General Psychology	3	PGS 100
Hematology	None**	Petition Botany/Microbiology Department if transferring from Arizona community college
History of American Education	3	SPF 411*
Human Growth and Development	3	CDE 232
Immunology and Blood Banking	4	MIC 420*
Introduction to Business Management	None	No Credit
Introduction to Calculus	4	MAT 270
Introduction to Marketing	3	Elective (no credit if major is in College of Business Administration)
Introduction to Sociology	3	SOC 101
Introduction to Business Law	3	Elective
Microbiology	4	MIC 201 and 202
Money and Banking	3	Elective (no credit or advanced placement if major is Economics or any major in College of Business Administration.)
Nursing (Anatomy, Physiology, Microbiology; Behavioral Sciences for Nurses; Fundamentals of Nursing; Medical-Surgical Nursing)	0	Not acceptable toward BS in Nursing.
Statistics	3	MAT 226 <i>or</i> EDP 454*
Tests and Measurements	3	EDP 454*
Trigonometry	2	MAT 118
Western Civilization (9)		
Ancient Near-East to 1648	6	HIS 100 and 101
1648 to the Present	3	HIS 102

*Lower division credit. **See note, petition needed.

All equivalency is subject to future review and possible catalog change.

For further information regarding CLEP, contact the University Testing Service at Payne Education Hall 302, or call 602/965-3104.

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3) Comprehensive Examinations. A comprehensive examination is intended to permit a student to establish academic credit in a field in which the student has gained experience or competence equivalent to an established University course. Applications are given only for courses listed in the current University catalog, and only for courses in which a comprehensive examination can serve as a satisfactory measure of accomplishment.

A number of restrictions apply. The student must be presently enrolled at Arizona State University with no more than 100 semester hours of credit earned. The examinations must be taken during the first two semesters in residence at the University. No more than 30 semester hours of credit may be established by comprehensive examinations and/or correspondence courses.

Comprehensive examinations may not be taken in any course in which the student has been given admission credit or transfer credit from any educational institution. If there is a question, the student should consult the Admissions Office. Credit may not be received for an examination in an elementary level of a field in which the student has earned more advanced credit, nor for a prerequisite for a course already completed.

The comprehensive examination is strictly a departmental function. An application is for one course only. The student completes an application form with the number, title, and number of semester hours of credit for the course. When completed, the application must be approved by the student's advisor and the departmental chair.

The student must then pay the stated fee for such examinations at the Cashier's Office. The receipt must be taken to the departmental office.

The examination will be prepared by the instructor who normally conducts the course, and is comprehensive in nature and scope. The instructor and other experts designated by the chair grade the examination, using letter grades: A, B, C, D, or E. If the grade is C or better, a mark of Y is entered on the student's permanent record; otherwise no entry is made. Credit by examination will be indicated as such on the record. The student will be notified by mail of the result of the examination. In case of failure (D or E), the student will *not* be given an opportunity to repeat the examination.

A student pursuing a second baccalaureate degree may not receive credit by comprehensive examination, but with prior approval of the college the student may use the examination to waive a course requirement, if a grade of C or better is earned.

4) Proficiency Examinations. Proficiency examinations are given to: a) waive a course requirement; b) validate certain transfer credits in professional programs; and c) determine a student's ability in a field where competence is an important consideration. Detailed information may be obtained from the dean's office of the college in which the student is registered.



Placement Examinations for Proficiency

English. An entering freshman with an ACT English standard score of 25 or better or SAT verbal score of 600 or better is automatically eligible to enroll in ENG 104 in place of ENG 101 and 102. Students scoring 23 or 24 on ACT or 540-590 on SAT are eligible to take the English Exemption Examination for placement in ENG 101, 102 or 104. The examination is given during the orientation period before the beginning of each semester and during the summer terms. Further information is available from the Director of Freshman English.

Foreign Language. For information regarding foreign language placement, see page 77 (Foreign Languages), and page 23 (Advanced Placement).

Mathematics. All students registering for introductory mathematics courses are required by the Department of Mathematics to take the Mathematics Placement Examination for registration. The examinations are given several times each semester and during the summer. They are designed to determine the course level which will be of most benefit to the student. For further information, contact the Director of Mathematics Placement, Physical Science Center, A Wing.

Traveling Scholars Program: The Traveling Scholars Program is designed for students to take advantage of programs or special resources at one of the three state universities not available at their own institution. Any undergraduate student with a 2.5 GPA or graduate student with a 3.0 GPA enrolled at Arizona State University, Northern Arizona University or University of Arizona may be designated a Traveling Scholar by prior mutual agreement of the appropriate academic authorities at both the sponsoring and hosting institution. Contact the University Registrar for additional information and the application form.

Defense Activity for Non-Traditional Education Support (DANTES)

Arizona State University is a participating institution with DANTES and is listed in the DANTES Directory of Independent study. DANTES is an executive agency of the Department of Defense which provides educational support for the voluntary education programs of all Services. The primary missions of DANTES are: (1) to provide

nationally recognized examination and certification programs as part of the voluntary education programs of military services; (2) to facilitate the availability of high-quality independent institutions for service men and women.

U.S. Armed Forces Institute Correspondence Courses. Arizona State University no longer grants military science credit for active service or courses that were taken through the military.

Fees, Deposits and Other Charges

Registration and Tuition Fees

Full-time Students

Students registered for 7 or more hours are considered full-time for fee purposes. Amounts listed are per academic semester. For further information on classification for fee status, see page 30 (Fee Status Classification, Procedures and Policies).

The following is a schedule of the total registration and tuition:

In-State Fee Status

Registration \$325.00

Out-of-State Fee Status

Undergraduate students registered for 12 hours and over pay a registration fee of \$325 plus tuition of \$1,150. Students registered for 7-11 hours pay the registration fee and a prorated tuition fee as follows:

12 hours and over	\$1,475
11 hours	1,381
10 hours	1,285
9 hours	1,189
8 hours	1,093
7 hours	997

Part-Time Students

Students registered for

6 hours or less \$36/hr.

Audit—Registration not for credit

Fees for auditing classes are the same as fees paid for credit.

Summer, Continuing Education and Correspondence

Further information is included in this catalog's section, University Continuing Education and Summer Sessions.

Summer Sessions/

Continuing Education	\$36.00/hour
Correspondence	18.00/hour

28 FEES, DEPOSITS, OTHER CHARGES

Additional Fees

Fees listed are per academic semester and are in addition to the general University registration and tuition fees.

Private Music Instruction

½ hour of instruction per week	\$40.00
1 hour of instruction per week	60.00
1 or more hours of instruction per week—music majors only	60.00

Musical instrument rental charge

Charge for use of University owned musical instruments	10.00
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Consult Music Department for specific information

Special Class Fees

Various University classes require payment of fees for special materials and rentals. These fees are listed in the schedule of classes for each semester.

Late Registration—

Regular Semester	\$10.00
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A late registration fee is assessed when a student registers after the regular start of classes.

Housing

For information on Housing, refer to catalog section on Student Services—Housing.

Other Fees and Charges

Admission Application	\$10.00
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All out-of-state undergraduate applicants must pay a non-refundable fee when application for admission is made.

Transcripts	\$ 1.00
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Request for transcripts should be made two weeks in advance of time desired.

Copies for educational records other than transcripts

<u>Number of Pages</u>	<u>Charge</u>
1 - 5	Free
6 - 10	\$2

Additional pages will be made at an increase of \$1 per 5 copies.

Graduation:

Undergraduate	\$ 7.00
Graduate	10.00

Late Graduation:

Undergraduate	\$12.00
Graduate	15.00

If the graduation charge is not paid on or before the date specified in the section of the catalog headed Graduation Requirements, a late fee of \$5.00 is added to the charge.

Graduation Reapplication:

Undergraduate	\$ 7.00
Graduate	\$10.00

Charge for reapplication when requirements were not met on original application are the same amount as the original application.

Course Withdrawal	\$ 1.00
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Charged following the last day of registration (per course withdrawn).

I.D. Replacement	\$5.00
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Charge for replacement of a lost or mutilated activity card

Replacement because of wear or deterioration will be free of charge.

Returned Check Service	\$ 10.00
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Students who have checks returned to the University by the bank for any reason will be assessed a \$10.00 service charge.

Comprehensive Examination	\$ 7.50/Sem. Hr.
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Paid by all students seeking to establish credit by examination (per semester hour).

Lost Receipt and Registration Material	\$ 1.00
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Parking Decals	\$ 5.00
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A parking decal must be purchased for each motor vehicle used by a student or employee on the University campus. For further information refer to catalog subsection—General Information—Parking.

Deposits (refundable):

Housing	\$50.00
Science breakage, depending on course	\$5.00 to \$25.00

Refunds

Registration and Tuition Fees

Students withdrawing from school or individual classes will receive a refund based on a percentage of the total semester fee paid in accordance with the following schedule:

Before first day of semester	Deduct \$10.00
1 thru 14 calendar days	80% refund
15 thru 21 calendar days	60% refund
22 thru 28 calendar days	40% refund
29 thru 35 calendar days	20% refund
After the 35th calendar day	No refund

Per cent of refund will be determined by the date the official withdrawal form is presented to the Business Office. In certain instances consideration is given when students must withdraw because of illness. For complete details contact the Registration and Fees section of the Business Office.

Summer Session Refunds

Students withdrawing from any Summer Session or individual classes in a given session will receive a refund based on a percentage of fees paid and in accordance with the following schedule:

Before first day of session	Deduct \$5.00
1st and 2nd days of session	80% refund
3rd day of session	60% refund
4th day of session	40% refund
5th day of session	20% refund
After 5th day of session	No refund

Refunds will be based on the first five class days beginning with the first day of the Summer Session, not on the first five meetings of any given students' classes.

Additional Fee Refunds

Private Music Instruction. If a student must drop a music course because of illness or other emergency beyond the control of the student, not more than half of the instruction charge may be refunded.

Special Class Fees. Refunds, if any, will be determined by the department offering the course. Determination will be based on progress in the course and type of activity.

Late Registration. Not refundable.

Additional University Charges

Refund of these payments will be determined on the individual circumstances. Under ordinary conditions they are not refundable.

Housing Charges

Refunds to students departing from residence halls prior to end of the academic year are computed on the following basis:

Deposits. Housing deposits are refunded as prescribed by the housing contract that each student signs when they apply for residence hall accommodations. Students should refer to this document for specific information on refunds. When checkout occurs prior to the last two weeks of the Spring semester, students forfeit their \$50 room deposit.

Rent. Students will be charged 10% of the total semester rate for each week or partial week of registered occupancy.

Board. Students will be charged for meals through the last day of the week 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 refund will be made for meals missed.

Check-out is based on the date the Housing Department is notified on a check-out form, not the last day of occupancy.

Payment of Refunds

All refunds will be made net of any amounts due the University. If the last day of the refund period falls on a weekend or holiday, the refund must be picked up during the regular office hours on the preceding day. For further information, see General Information—Forfeiture of Refunds, below.

General Information

Change in Fees

The Board of Regents reserves the right to change fees and charges without notice.

Payment of Fees

Students pre-registering may apply monies made available through the Financial Aids Office to their registration fees if the money has been authorized for release by the Financial Aids Office.

Registration and related fees are payable in full on the day of registration. (See Veteran's Deferred Payments).

Method of Payment

Payments to the University should be made by currency, traveler's check, bank money order, cashier's check or certified check. Personal or company checks in the exact amount of the charges will generally be accepted.

If any payment tendered is unauthorized, incomplete, or received after the due date, registration fees will be considered *not paid*.

The University reserves the right to refuse any type of payment.

Veteran's Deferred Payment

As provided by the Veteran's Readjustment Assistance Act, veterans may apply for deferred payment of registration fees. A "Certificate of Eligibility" must be presented. Contact the Business Office in advance to be assured of meeting the necessary requirements. The University reserves the right to deny this privilege to anyone.

Forfeiture of Refunds

All refunds and deposits due students for any reason are subject to forfeiture unless obtained on or before June 30 of the year in which they were originally paid. Refunds will not be made without student identification. Should June 30 fall on a day when the Business Office is closed, the refund must be picked up during the regular office hours before June 30.

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Checks Returned by the Bank

Checks returned by the bank for any reason will be assessed a \$10.00 service charge. Restitution of funds *must* transpire within 10 business days after the check is returned to the University. Personal checks or requested re-submittal of returned checks will not be honored as acceptable methods of restitution. Currency, money orders, cashier's checks, certified checks, traveler's checks or acceptable credit cards (VISA and Master Card) are the only acceptable means of restitution. All students are subject to involuntary withdrawal from the University for nonrestitution of funds within the maximum 10 day restitution period. All students will be charged tuition (if applicable) and fees based upon the percentage of time in attendance during the semester (see Refunds). In all cases, upon receipt of the returned item, University services will be immediately suspended for the subject student.

Delinquent Financial Accounts

Students with outstanding financial obligations will be refused all University services until such obligations are paid. They will be denied subsequent enrollment, transcripts, grades, transfer of credit, and graduation. Failure to respond to notifications of outstanding financial accounts will result in a Records Hold, and potential withdrawal from the University.

Parking

Anyone who parks or expects to park (whether owned, leased, or borrowed) a vehicle on the University Campus must register each vehicle and secure and display a current parking decal. Violations of the parking regulations are subject to citation and fines. Appeals to parking citations may be filed with the Parking Administrator, and after payment may be further appealed through the Parking Appeals Board. Unpaid parking citations will become part of delinquent accounts and are subject to the above paragraph.

Fee Status Classification Procedures and Policies

The Arizona Board of Regents is required by law to establish for the universities under its jurisdiction and control uniform guidelines and criteria for the classification of students for payment of registration and tuition. All questions and discussions relating to classification for fee status should be directed to the Fee Classification Office, Arizona State Uni-



versity, PEBW 124, Tempe, AZ 85287 or call (602) 965-7112.

Financial Aid

Individuals who wish more detailed information on any scholarships, grants, loans or other financial assistance programs, are urged to write or call the Office of Financial Aid, Matthews Center, (602) 965-3355.

Student aid at Arizona State University combines private, institutional, state and federal scholarship, grant, loan, and employment programs.

The Financial Aid Office assists qualified students in obtaining financial aid to attend ASU to the extent that funds are available. *Financial aid is an individual process from admission and requires separate applications.*

Students pre-registering may apply monies made available through the Financial Aid Office to their registration fees. *Financial Aid money is not automatically applied.* Only money which has been authorized for release by the Financial Aid Office may be used.

Types of Financial Assistance

Please refer to publications of the Financial Aids Office for detailed information.

Basic Educational Opportunity Grants (BEOG)
Supplemental Educational Opportunity Grants (SEOG)

College Work-Study Employment (CWS)
National Direct Student Loans (NDSL)
Federally Insured Student Loan Program (FISL)
Law Enforcement Education Program Loans and Grants (LEEP)

Nursing Student Loans
Bureau of Indian Affairs Grant (BIA)
State Student Incentive Grants (SSIG)
Veterans Educational Loans
Migrant Opportunity Program (MOP)
Scholarships
Short-Term Loans (STL)

STUDENT BUDGETS

(Estimated Amounts Per Academic Year for 1981-83)

	Commuter*	Dorm	Off-campus	Married**
University Fees	\$ 650	\$ 650	\$ 650	\$ 650
Books/Supplies	325	325	325	325
Room/Board	1,265	2,415	3,360	5,175
Personal	700	700	700	1,400
Transportation	<u>650</u>	<u>375</u>	<u>650</u>	<u>650</u>
Total (Arizona Resident)	\$3,590	\$4,465	\$5,685	\$8,200
Tuition (Out-of-State)	<u>\$2,300</u>	<u>\$2,300</u>	<u>\$2,300</u>	<u>\$2,300</u>
Total (Out-of-State)	\$5,890	\$6,765	\$7,985	\$10,500

Other expenses such as child care, dissertation costs, medical expenses which exceed 5% of the budget, etc., may be included in a budget with proper documentation.

*A commuter student is defined as one who lives in the college community with the parents. Room and board expenses have been allowed.

** With one spouse enrolled.



Classification of Courses

Information about courses appears in two places, the *General Catalog*, published once every two years, and the *Schedule of Classes*, published before the beginning of every semester.

The course numbering system is as follows:

100-299 ("Lower Division" Courses) are freshman and sophomore level courses, designed primarily for these students. Certain classes are closed to freshmen who lack the designated prerequisites or are majoring in other departments. This information is available in the *Catalog*, the *Schedule of Classes*, or from the student's curriculum advisor.

300-499 ("Upper Division" Courses) are designed primarily for juniors and seniors and other advanced students. Prerequisites and other restrictions should be noted before registration. Courses at the 400-level apply to graduate degree requirements for an individual program of graduate study when approved by the Graduate College.

500-799 ("Graduate Level" Courses) are designed for graduate students. However, upper-division undergraduate students may enroll in graduate courses with the approval of their advisor, the course instructor, the department chair, and the dean of the college in which the course is offered. If the course does not meet an undergraduate graduation requirement, it may be eligible for use in a future graduate program on the same basis as work taken by an unclassified graduate student. (See *Graduate College Catalog* or page 350.)

Special Topics 294, 494. The numbers 294 and 494 have been reserved for courses covering topics of immediate or special interest of a faculty member and students. Credit, 1-4 hours.

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 number 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. To be eligible for an Independent Study course a student must have a cumulative grade

point average 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 the major or field of specialization on an individual basis with a minimum of supervision or direction.

An Independent Study course is not a substitute for a catalog course, nor a means of taking a catalog course on an individual basis. Courses listed in the catalog may not be taken as Independent Study.

Application for Independent Study must be made well in advance of the 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 chair of the department in which the course is taken. A special class fee may be required. Credit 1-3 hours.

Special Liberal Arts Courses. Liberal Arts 100, 101, 150, 401, 402 are interdisciplinary courses offered by the College of Liberal Arts. LIA 100 (University Adjustment and Survival) and LIA 101 (Use of Research Libraries) are open to all students; LIA 150 (Introduction to Asia) is open to students who have not had any exposure to the Asian studies; LIA 401 (The Meaning of the 20th Century) follows a lecture structure and is open to all upper division students and to others by approval of the instructor; LIA 402 (Movements and Meaning in Latin America) offers lectures by a variety of specialists.

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 Honors Programs.

An omnibus course is one at a certain level available to academic units who may use their own prefixes before the number. The omnibus number (initially approved by the Provost) is to be used for courses offered on an experimental basis. The title and course content varies with the subject matter.

Special Courses. Undergraduate Internship (484), Special Courses for Research Methods (500), Practicum (580), Field Work (583), Internship (584), Reading and Conference (590), Seminar (591), Research (592), Applied Project (593), Conference and Workshop (594), Special Topics (598), Thesis (599), Research Methods (600), Practicum (680),

Field Work (683), Internship (684), Reading and Conference (690), Seminar (691), Research (692), Applied Project (693), 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 previous course requirement (prerequisites) listed for it or otherwise satisfy the instructor that equivalent preparation has been completed.

Courses Offered. The University does not offer all of the courses listed in the catalog annually or each semester. The *Schedule of Classes* should be consulted for those courses offered each semester.

Key to Course Listing Abbreviations

GLG	Departmental prefix designation
410	Course number
(3)	3 units credit
F	Course offered fall only
S	Course offered spring only
SS	Course offered summer session only
F,S	Course offered both semesters
A	Course offered once a year
F'81,S'82	Course offered every other year on semester indicated
N	Course not regularly offered
†Dagger	indicates further prerequisites

Grading System

Scholarship Grades and Marks. All grades and marks will appear on the grade report and the permanent record.

They are indicated by the following letters:

A—Excellent	E—Failure
B—Good	Y—Satisfactory
C—Average	W—Withdrawal
D—Passing	I—Incomplete
P—Pass	X—Audit
NR—No Report	

Grading Options. Ordinarily a grade of A, B, C, D, or E is given upon completion of a course, unless a grading option of "Audit" or "Pass-Fail" is indicated at the time of registration. *Grading options cannot be changed after the close of the drop/add period.*

Audit Enrollment. A student may choose to audit a course, in which case he or she attends regularly scheduled class sessions but no credit is earned. The student must first obtain the instructor's approval, be properly registered, and pay the fees for the course. An audited course, however, is counted in the student's course load.

The mark of X will be recorded for completion of an audited course, unless the instructor determines that the student's participation or attendance has been inadequate. Then the mark of W may be recorded. This grading option may not be changed after the close of drop-add.

Satisfactory. The mark of Satisfactory (Y) may be used at the option of individual colleges and schools within the University, and is appropriate for seminars, internships, projects, workshops, theses, readings and conference and research. The Y is included in earned hours but is not computed in the grade point average.

Incomplete. A mark of Incomplete (I) is given by the instructor only when a student who is otherwise doing acceptable work is unable to complete a course because of illness or other conditions beyond the student's control. The student is responsible for contacting the instructor to arrange for completing the course within a reasonable time. (Some colleges limit this to the immediately following semester.) If the instructor is not available, the student should contact the department chair. When the course work has been completed, the instructor will submit a "Change of Grade" form through the Dean to the Registrar's Office. The I will be removed and the appropriate grade and credit entered. A student does not re-register or pay fees for a course in which an Incomplete (I) has been received in order to complete the course. Unless the instructor changes the I, it becomes part of the student's permanent record. There are special regulations or time restrictions on the mark of I in several colleges and schools of the University which should be noted.

Withdrawal. The mark of W may be recorded in a course whenever a student withdraws or is

34 GRADING SYSTEM

withdrawn from a course or officially withdraws from the University.

An instructor may not assign the mark of W unless a withdrawal has been properly processed with the Registrar's Office.

Repeating Courses. An undergraduate student who has received a grade of D or E in any course(s) taken at ASU may repeat the course(s) in order to improve his or her grade point average. The student must be properly registered and must have paid any required fees for the course(s) to be repeated. The course must be repeated in residence at Arizona State University with a grade of C or better before completing a first bachelor's degree. After completing the course with a satisfactory grade, the student must then file a "DLE Deletion Form" with the Registrar's Office. The original entry remains on the student's record, but the new grade is recorded and computed into the cumulative grade point index. Note: There are limitations on repeating courses in the Colleges of Architecture and Nursing and the School of Social Work.

A student may *not* repeat for credit a course in which a grade of C or better has been earned.

Grade deletion procedures (for repeating courses) do not apply to graduate students.

Withdrawal by Instructor. An instructor may withdraw a student from the class with a W or E, when the student's progress or conduct justifies such action. The instructor must initiate a withdrawal prior to the withdrawal deadline.

Among the reasons for such withdrawal are: unjustified absences, disruptive classroom behavior, and lack of progress or achievement. A student may appeal an instructor-initiated withdrawal to the standards committee of the college in which the course is offered. The decision of the committee will be final.

Change of Grade. The instructor of a course has the sole and final responsibility for any grade reported for that course.

Once a grade has been reported to the Registrar's Office, it may be changed only (1) upon the signed authorization of the faculty member who issued the original grade, or (2) if the instructor is no longer at ASU, by the academic grievance committee of the college in which the course was offered. In either case, approval is required by the dean of the college concerned. This applies also to grades of Incomplete (I).

A student who feels that the grade received is unjust may appeal to the academic grievance committee. The decision of the dean is final. (See *University Policy for Student Appeal Procedures on Grades* in each college dean's office).

Grade Points. For the purpose of computing the grade point 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.

Grade point averages are rounded to the nearest hundredth of a grade point.

Grade Point Average. The grade point average (GPA) is obtained by dividing the total number of grade points earned by the number of semester hours in the student's course load graded—A, B, C, D, or E (net hours). *Semester GPA* is based on *semester* net hours. *Cumulative GPA* is based on *total* net hours.

Mid-Term Deficiency Report. Instructors are required to evaluate students at mid-term for scholarship deficiencies. A student who has been evaluated for a D or E at mid-semester will receive a deficient scholarship report. The mid-term D's and E's are not recorded on the student's permanent record. Mid-term reports are mailed to the student's local address of record.

Final Grade Report. A grade report will be sent to each student at the end of each semester to the home address of record.

It is the responsibility of the student to keep the Office of the Registrar informed of address changes.

Dean's List. Undergraduate students who earn 12 or more graded credit hours (pass-fail are excluded) during a semester in residence at Arizona State University with a grade point average of 3.50 or better are eligible for the Dean's List. A notation regarding Dean's List achievement will appear on the final grade report for the semester.

Records Hold. The Registrar's Office will place a "Records Hold" on the records of a student when the Business Office reports an outstanding financial obligation or if the requirements for readmission to the University have not been met.

When a "Hold" is placed on a record, the student does not receive a grade report and credit earned is not reported for the current semester's work. Furthermore, an official or unofficial transcript will not be issued for that

student, and all further registration privileges will be automatically suspended.

The "Hold" will remain on the records till it is removed by the initiating office. It is the student's responsibility to clear the conditions causing the "Hold."

Transcripts. The Registrar's Office will release official transcripts only upon written request of the student. The request must include the student ID number, date of birth, date of last attendance, and name(s) used at ASU. No transcript will be issued in case of a "Records Hold" (see above). If the transcript is to be mailed, the student must also supply a specific address. The fee for an official transcript is \$1.00 a copy.

Unofficial transcripts may be requested in person at the Registrar's Office or by mail if a self-addressed stamped envelope is enclosed. There is no charge for an unofficial transcript.

Requests will not be accepted from third parties without a written release from the student.

Retention and Academic Standards

Class Standing of Students.

- 1 - Freshman, 24 or less hours earned
- 2 - Sophomore, 25 - 55 hours earned
- 3 - Junior, 56 - 86 hours earned
- 4 - Senior, 87 or more hours earned
- 5 - Graduate, Bachelor's degree from accredited institution

Good Standing. Good standing for the purpose of retention is defined as follows:

Total Earned Hours	Minimum Cumulative GPA
24 or less	1.60
25 - 55	1.75
56 or more	2.00

An individual college may set grade point average standards for one or more of its programs. In order to transfer from one college to another within the University, a student must have a 2.0 GPA or better. The GPA determining good standing is computed on courses taken only at Arizona State University.

Probation. A student's college assumes responsibility for enforcing academic standards, and may place on probation any student who has failed to maintain good standing as defined above. A student on academic probation is required to observe any rules or limitations the college may impose as a condition for retention.

Disqualification. A student who is placed on probation at the end of a semester is subject to disqualification by the college at the end of the following semester if the conditions imposed for retention are not met.

Disqualification is exercised at the discretion of the college and becomes effective on the first day of the semester following college action. *A disqualified student is notified by the dean of the college and is not allowed to register at the University until reinstated.* A student who receives notice of disqualification may appeal to the college standards committee. A student disqualified or otherwise not eligible for regular admission may not attend as an unclassified student.

Reinstatement. In order to be reinstated, the student must submit an application for reinstatement to the disqualifying college. If the student chooses to transfer to another college within the University while disqualified, application for reinstatement must be made to the University Undergraduate Admissions Board.

A disqualified student who has not registered for one or more semesters must apply for reinstatement and readmission. The application for reinstatement must be made before the student files an application for readmission.

Reinstatement Appeals. A student wishing to appeal the decision of the standards committee of a college may apply for a hearing before the University Undergraduate Admissions Board. The decision of the Board is final.

Academic Renewal

An undergraduate who has been readmitted to the University after an absence of at least five years, and who has satisfactorily completed at least one additional semester, may, upon petition to the dean of the college, have his or her former record treated in the same manner as transfer credits. That is, credit will be granted for up to 64 hours in courses in which a grade of C or better was earned, and the original cumulative index will be listed separately rather than included as part of the ASU index. Such academic renewal may be effected only once during a student's academic career. Students who elect to petition for academic renewal must be aware that a summary of the former record remains on the transcript and that, although eligibility for graduation is based on the ASU index, most graduate and professional schools to which the student may

later apply will average the two records together, as they would for transfer students.

General Studies

Arizona State University students are required to demonstrate a satisfactory level of basic knowledge in the humanities, fine arts, social and behavioral sciences, and sciences and mathematics. Specific patterns of General Studies requirements are established by the colleges within the overall program. Since requirements under this program vary somewhat from one curriculum to another, students should refer to the catalog description of the recommended General Studies program within the college in which they are enrolled. Specific disciplines listed within the three overall categories are *not necessarily applicable* to the General Studies program and graduation requirements of each college.

Students transferring from approved institutions of higher education ordinarily will be given General Studies 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 upper and lower division 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 specific by the individual colleges:

Humanities and Fine Arts

Architecture, Art, Dance, English, Foreign Languages, Interdisciplinary Humanities, Music, Philosophy, Religious Studies, Theatre.

Students select with the advisor's approval, two or more courses within a pattern designed to enhance their 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, Agribusiness, Anthropology-ASB, Business Administration, Communication, Criminal Justice, Cultural Geography, Design Sciences, Economics, Educational Foundations,

Engineering, Health Education, History, Home Economics, Journalism and Telecommunication, Leisure Studies, Military Science, Planning, Political Science, Psychology-PGS, Public Affairs, Recreation-REC, Sociology.

Students select with the advisor's approval two or more courses within the social and behavioral sciences. This pattern is designed to expand knowledge and 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.

Science and Mathematics

Anthropology-ASM, Botany, Chemistry, Computer Science, Engineering, Geology, Mathematics, Physical Geography, Physics, Psychology-PSY, Zoology.

Students select with the advisor's approval two or more courses, one or more of which must have a laboratory. These selections 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 their destiny.

To complete the total credit hours requirement in General Studies, students with the advisor's approval shall select appropriate electives from the above fields or from other fields approved within the framework established by each college. Requirements in the three 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 by approval of the college. See College General Studies requirement for graduation.

Interdisciplinary Studies

City and Regional Planning. The city and regional planning focus provides undergraduate students of various disciplines a familiarity with this area's concerns, theories, and techniques. These draw from course offerings related to planning in various departments of the University (Planning, Geography, Geology, Civil Engineering, Public Affairs, Business Administration, History, Sociology, Home Economics).

Energy Studies. An expanding instructional and research involvement in energy matters exists through three curricular paths: (1) General Studies, which emphasize energy as an elective beyond the scope of a chosen major (for more information contact Chair, Department of Geography); (2) Specific studies in the Department of Planning (College of Architecture, usually for those pursuing the Master of Environmental Planning degree); (3) Specific studies in the College of Engineering and Applied Sciences, usually for those seeking a degree in a branch of Engineering.

Environmental Studies. The Center for Environmental Studies was established to initiate, coordinate and encourage research, community service, and academic programs. The Center does not formally offer courses or a degree program. It sponsors special courses, conferences and workshops on environmental topics. Drawing from faculty and students throughout the University, the Center participates in research and community programs relating to environmental problem areas.

Film Studies. The film studies program exists not only to provide information and experience but also to serve as a means of creative expression for the student and as a useful subject and tool in teaching. The program is not designed to produce professional filmmakers. However, it may provide practical preparation for students desiring further film study in other institutions.

Inquiries about this program should be directed to the Chair of the Interdisciplinary Film Committee or the Film Studies Advisor in participating colleges.

Gerontology. Course work in gerontology is currently offered in nine departments throughout many disciplines. Gerontology by its very nature is an interdisciplinary study of the biological, psychological and sociological aspects of aging; and the economic, political, legal, social and health-related issues of the older person. The purpose of this interdisciplinary activity is to provide a student with sufficient background to work in a variety of gerontological occupations. A student majors in one of the currently existing disciplines but takes individual course work within the variety of departments which offer gerontology related courses. Inquiries about the program should be directed to Chair of the Multi-Disciplinary Coordinating Committee on Aging.

International Programs and Studies. International matters and an understanding of other nations are reflected in course offerings throughout the University. Special area emphases are coordinated through the Center for Asian Studies (page 52) and the Center for Latin American Studies (page 54). These two centers also publish quarterly journals, research reports, and scholarly monographs. The Hayden Library has extensive collections on international subjects in selected areas.

University academic year student exchange programs exist with universities located at Guadalajara, Hermosillo and Monterey in Mexico and at La Paz in Bolivia. Summer school programs in Guatemala and Europe are also available. Foreign students are also attracted annually to the intensive English Skills Program for International Students (page 22).

Islamic Studies. The art, history, geography and religion of the Islamic world are the subjects of several courses offered by departments in the Fine Arts and Liberal Arts Colleges.

Medieval and Renaissance Studies. Significant opportunities for the study of Medieval and Renaissance culture exist at Arizona State University. Hayden Library has an extensive microfilm collection in Medieval and Renaissance Studies, and many rare books. The Collegium Musicum, composed of graduate and undergraduate students, regularly presents public performances of Medieval and Renaissance music. In addition, the Arizona Renaissance and Medieval Society (ARMS) sponsors programs and lectures providing a forum for students and faculty interested in Medieval and Renaissance culture. The society, founded in 1978, is made up of faculty members from history, literature, philosophy, religion, music, art, and science. For a list of advisors, see Interdisciplinary Studies in the College of Liberal Arts.

Women's Studies. An interdisciplinary perspective on women serves as the vehicle for a critical exploration of the role and status of past and present women, assumptions about women accepted in American culture, the validity of research on women, the effect on women of political, economic, and social systems, and the contributions of women to world culture. The student has the opportunity to consider alternative ways of looking at the assumptions that affect the image of women and to make a research contribution to the field. Inquiries about this program should be

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directed to the Director of Women's Studies, College of Liberal Arts, and the fall and spring Women's Studies brochure.

Registration

A student is only considered by the University to be registered when all registration fees have been paid in full. Then, the student's name will appear on the instructor's official class list.

Eligibility. Only eligible students may register for courses at Arizona State University. An eligible student is either continuing from the previous semester or one who has been admitted or readmitted to the University (see Admissions, pages 17 and 22).

Advisement. Each college provides advisors who assist the student in planning a program of study and selecting courses for each semester. The student has the responsibility to seek advisement and to meet all the degree requirements.

Times of Registration. The University conducts an early registration, regular or "walk-through" registration, and late registration for each semester and Summer Session. The dates, times and procedures are published in the *Schedule of Classes*.

Registration Fees. Registration fees are due and must be paid in full at the time specified each semester in the *Schedule of Classes*. If any payment tendered is unauthorized, incomplete, or received after the due date, registration fees will be considered not paid.

Schedule of Classes. The *Schedule of Classes* is the official publication of the Registrar's Office each semester and distributed without charge. The *Schedule* lists the semester's course offerings, dates, times, places, and procedures for registration, along with other important information relating to the semester.

Unit of Credit. The semester hour is the unit on which credit is computed. It represents one 50-minute class exercise per week per semester.

Course Loads. A minimum full-time course load for an undergraduate student is 12 semester hours. The maximum course load for which a student may register is 18 semester hours. The maximum for students in the Colleges of Engineering and Applied Sciences and Architecture is 19 semester hours. A student wishing to register for more than the maximum must petition the standards committee of the college in which he or she is enrolled and must have an approved overload petition on file with that college before registering.

Enrollment Verification Guidelines. Arizona State University is frequently required to certify a student's enrollment as to full-time, part-time, etc. The following general guidelines are used primarily to verify enrollment for the purpose of loan deferments and eligibility. The Registrar is responsible for such verifications.

Regular Semester	Full-Time	Half-Time	Less Than Half-Time
Undergraduate	12 or more hours	6 hours	5 or less hours
Graduate	9 or more hours	5 hours	4 or less hours
Graduate Assistant	6 or more hours	3 hours	2 or less hours
Five Week Summer Session			
Undergraduate	4 or more hours	2 hours	1 hour
Graduate	3 hours	2 hours	1 hour
Graduate Assistant	2 hours	1 hour	---
Eight Week Summer Session			
Undergraduate	6 hours	3 hours	2 or less hours
Graduate	5 hours	3 hours	2 or less hours

Attendance. The instructor has full authority to make decisions regarding attendance.

Official Withdrawal from the University.

There is only one procedure by which a student may officially withdraw from *all* classes after having paid registration fees. The student must initiate an official withdrawal from the University by appearing in person or by addressing a signed request to the Registrar's Office, Arizona State University. The date of the official withdrawal is always the date the withdrawal form or letter is received in the Registrar's Office.

If a student withdraws before the end of the guaranteed W period, the W will be automatically recorded for all classes for which the student has registered. The student is eligible for a refund of fees paid in accordance with the refund schedule at the time of withdrawal.

If a student withdraws after the guaranteed W period, the instructor of each course for which the student has registered will receive a notice of the date of withdrawal and a W or E will appear on the final class list for each class. The instructor's assignment of a W or E depends upon the student's status in each course at the time of official withdrawal.

No one will be permitted to officially withdraw from the University or conduct any registration transaction in the last two (2) weeks of the semester.

Application for Graduation. A student should apply for graduation after having completed 87 semester hours. An application is available at the Graduation Office, 134 Moeur Administration Building. Along with the "senior check sheet," the student should obtain two transcripts from the Evaluator's Section, 114 Moeur Administration Building. With the assistance of an academic advisor, the student should complete the forms for processing by the college in which the student is to earn the degree.

The application and check sheets must be on file in the Graduation Office at least one semester before the planned date of completion. The degree will be awarded when all the requirements on the senior check sheet have been fulfilled.

If the student or advisor makes an adjustment in the designation of courses to be completed, an approved petition with the necessary signatures is required and must be forwarded to the Graduation Office.

The student is responsible for successfully completing all courses designated on the application. The Graduation Office is responsible only for verifying courses to be completed. When the degree is awarded, the diploma will be mailed to the student. If all degree requirements are not met, the application for graduation will be withdrawn, and the student will be notified by a letter sent to the address given for diploma mailing.

A graduation reapplication is required to apply for the degree at a future date.

Petition for Waiver of Degree Requirement.

Any student wishing to have a college degree requirement waived must petition the standards committee of the college in which the student is enrolled. All petitions for waiver of degree requirements must be forwarded to the Graduation Office indicating the recommendation of the standards committee

Graduation Requirements

University Credit Requirements. A minimum of 126 semester hours is required for graduation with a bachelor's degree unless otherwise noted by the college offering the degree. A minimum of fifty (50) semester hours in upper division courses are required for graduation.

Not more than 30 hours of credit in correspondence courses, extension and/or by comprehensive examination will be accepted for credit toward the bachelor's degree.

English Proficiency. ENG 101 and 102 (6) or ENG 104 (3) are required for graduation from Arizona State University in any baccalaureate program. (See page 27.)

Grade Point Requirements. The cumulative grade point average must be 2.00 or better for all courses taken at Arizona State University for a bachelor's degree.

Resident Credit Requirements. Resident credit refers to a course which is offered in a regular semester or summer session. A minimum of 30 semester hours earned in resident credit courses at Arizona State University is required of every candidate for the bachelor's degree. The final 12 semester hours immediately preceding graduation must be of resident credit.

Graduation with Academic Recognition. A student must have completed at least 60 semester hours of resident credit courses at

40 GRADUATION REQUIREMENTS

Arizona State University to qualify for graduation with academic recognition for each baccalaureate degree. A student with a cumulative grade point average of: 3.40 will graduate *cum laude*, 3.60 will graduate *magna cum laude* and 3.80 or above will graduate *summa cum laude*. The cumulative grade point average for these designations will only include all course work taken at Arizona State University. All designations of graduation with academic recognition will be indicated on the diploma and on the student's permanent record.

Determination of Catalog for Graduation.

The University Catalog is published once every two years. Requirements for a department, or college, or the University as a whole may change and are often upgraded.

In determining graduation requirements, a student may use only one catalog.

A student whose attendance at the University has not been interrupted will graduate under the curriculum, course requirements, and regulations for graduation in effect at the time of admission to the University. A student may choose to graduate under any subsequent Catalog issued while the student is in continuous attendance.

A student who has been readmitted (page 22) will graduate under the curriculum, course requirements, and regulations for graduation as stated in the Catalog at the time of readmission or thereafter while in continuous attendance.

Applications for Teaching Certificates.

Applications for teaching certificates should be obtained from the office of the Director of Student Services in the College of Education.

Second Bachelor's Degree. The student seeking a second bachelor's degree must meet admission criteria for that degree. To obtain a second bachelor's degree, a student must successfully complete a minimum of 30 additional hours or more of resident credit and must meet all degree and University requirements of the second degree. Graduation index requirements must be met after the first degree.

A student may only pursue two bachelor's degrees at the same time if prior approval is given by the standards committee(s) of the college(s) involved. In either case, a minimum of 30 additional hours is required.

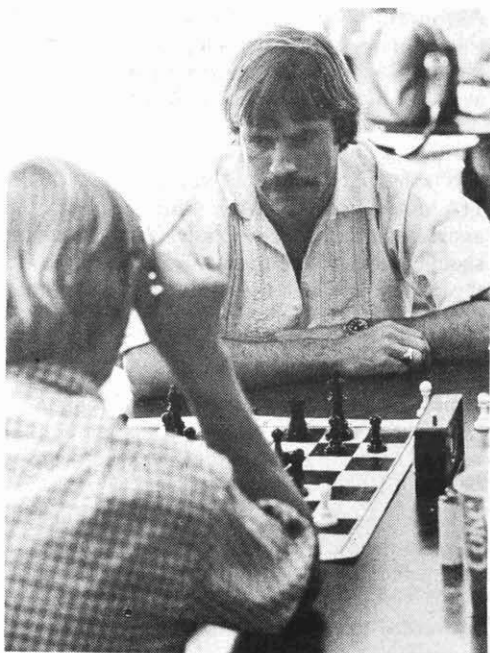
Graduate Degrees. See section of this catalog headed Graduate College and College of Law for graduate degrees offered and statements of requirements for graduate degrees. A

separate catalog can be obtained from the Graduate College.

Western Interstate Commission for Higher Education (WICHE)

For Arizona residents who wish to attend professional schools of dentistry, veterinary medicine, occupational therapy, optometry, and podiatry in one of the other western states, Arizona has joined with the other western states to create the Western Interstate Commission for Higher Education through whose effort and agency qualified Arizona residents may attend schools in these other states at essentially the same expense to the students as to residents of the state in which the school is located. Students must have maintained at least average grades in their pre-professional work and must have been legal residents of Arizona for at least the last five years. Recipients are required to return to Arizona to practice or to repay a portion of the funds expended in their behalf.

For further information and applications, interested students should contact Dr. Odus Elliot, Certification Officer, Arizona Board of Regents, 1535 West Jefferson, Phoenix, Arizona 85007, (602) 255-4082, or Dr. Brice W. Corder, Assistant Dean, College of Liberal Arts, Pre-Health Professions Office, SS 107, (602) 965-2365.



Student Services

The University provides a variety of services available to enrolled students which are designed to meet their needs. While some relate to the academic concerns of students, others are designed to help the student in personal, emotional, economic, and health areas. Most of these services are free. A full program of student activities contributes to student learning experiences outside of the classroom.

Housing

The residence hall system includes 13 residence halls housing approximately 4,400 students. Residence halls contain a variety of facilities such as study areas, TV lounges, conversation lounges, and coin-operated laundry areas. A professionally trained staff provides residents with assistance in all aspects of residence hall living.

Application. Residence hall application information may be obtained from the Housing Office, 110 Memorial Union. Students desiring residence hall accommodations should apply *at least six months in advance*. Demand for on-campus housing exceeds supply. Early application is imperative. Only students admitted to the University may live in a residence hall; however, applications are accepted prior to official admission.

Residence hall assignments are made based upon the date of receipt in the Housing Office of the completed application, contract, and \$50 deposit. Room reservations must be claimed by dates outlined in the contract or they will be automatically cancelled. Room occupancy is contingent upon formal University admission and continued enrollment.

Application information contains a description of residence hall meal services. A variety of meal options is available.

Disabled students may reside in residence halls if they are able, through their own efforts or with assistance provided by an attendant, to carry on routine tasks of daily living. A limited number of specially modified rooms is available to students whose disability requires such assignment. Requests for such assignment should be noted on the application.

Student Health Service

This service is staffed by physicians, nurse practitioners and registered nurses. Outpatient facilities are staffed by laboratory and X-ray technicians, registered pharmacist and clerical personnel.

Health Service Treatment. Clinic services are available to students during posted hours. Extended gynecological services are available during regular clinic hours with significant emphasis on education. Mental health and medical specialty consultant services are part of the Student Health Service out-patient clinic and appointments may be made for the use of these services. Students identified as having either an uncompensated psychiatric illness or a physical illness which can be hazardous to the safety of other persons may be withdrawn temporarily or permanently from the University.

Financial Responsibilities. All students registered for 7 hours or more are entitled to Health Service care according to established policies. Students carrying less than 7 hours are charged an affordable user fee for each clinic visit. 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.

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Student Insurance. Insurance policies available through the Health Service help defray the cost of accidents or any necessary hospitalization. Insurance coverage is mandatory for international students. All students enrolled at the University are eligible for student health insurance coverage.

Counseling Service

A staff of psychologists is available for confidential interviews. Appointments may be made to discuss personal, vocational, academic and social concerns, understanding of self and evaluation of long-term goals. Increased self-understanding often offers students the opportunity to make more effective use of their intellectual and personal resources. Call or stop by Wilson Hall, Third Floor.

Counseling does not involve telling the student what to do; the student makes the decisions. Thus, emphasis is placed on the ultimate responsibility of individuals conducting their own lives and making the most of their opportunities.

Group counseling is also available. This allows students the opportunity to explore and share their problems with other students.

The Counseling Service does not offer academic course or program advisement. This is a service offered by faculty advisors.

Dean of Students Office

The Dean of Students Office is primarily concerned with the total development of the student through programs and activities which will enhance the ASU educational experience. The office is composed of the following program and service areas: Student Organizations, Student Activities, ASU Student Foundation, Student Conduct, Special Use Facility Scheduling, and advisement of Interfraternity Council, Panhellenic Council, Native American Students, and Student Personnel Internships.

The Dean of Students Office works closely with the academic, business and support services departments of the University to make sure each student is aware of and uses available resources. Staff members act as advisors, ombudsmen, and as liaisons with other departments. This office is one of the major information and referral points on campus and is located in Matthews Center.

Career Services

The office of Career Services assists students and alumni in obtaining employment. Candidates seeking assistance are encouraged to register in the appropriate division both for contacts with employers and the process of self-directed placement.

The Business, Industrial and Governmental Division serves graduating students and alumni who are seeking professional positions in these areas. Credentials are maintained five years from date of latest use.

The Educational Division assists graduating students and alumni in obtaining teaching and administrative positions in elementary schools, secondary schools and institutions of higher education. Credentials are maintained ten years from date of latest use.

The Career Resource Division communicates up-to-date information helpful to the faculty and staff who work with students still making career decisions.

In addition to these divisions, other services available include off-campus student part-time and summer jobs, advisement for the disabled student, and a career coordinated employment program.

Special Services Program

Special Services provides a major educational thrust for low income and ethnic minority students through its programs.

Disabled Student Program. This program coordinates in one central office various resources and services required to meet the varied needs of the disabled students. (See page 21.)

Educational Opportunity Center. A one-stop shopping center for the consumers of education where disadvantaged youth and other clients can obtain the assistance and encouragement to enter and continue their postsecondary education. (Off campus location).

Educational Opportunities Program. The Educational Opportunities Program provides direct academic tutorial support to any student experiencing academic difficulties. Services include a learning skills center which houses diagnostic testing, course advisement, orientation and a remedial math laboratory. Mini courses are available in specific problem areas requiring individual concentration and

self-instruction under the guidance of a tutor. EOP strives to develop within each of its participants a sense of academic discipline while reinforcing academic proficiency and pride in personal achievement.

Upward Bound. Upward Bound assists the underachieving, talented high school student by providing an innovative and stimulating curriculum during his/her high school years, through a specially-designed program within the university atmosphere. Its goal is to provide the academic foundation and motivation for the successful transition to the college campus upon high school graduation.

Veterans Affairs Office

Coordination of separate University services assisting student veterans of the Armed Forces of the United States is centered in the Veterans Affairs Office. Counseling is available to the student veteran regarding admissions, financial aids, registration, veteran benefits and academic and personal advisement. Veterans Affairs programs serve the State of Arizona by advising all interested veterans regarding educational benefits and their optimum use. The program also assists veteran students to obtain suitable paid tutors, when needed, using their federal benefits.

Veterans must make adequate grade-point average and semester hour progress towards their academic program for continued funding by the Veterans Affairs Office. The University must report this progress each semester.

Veterans programs are maintained by a cooperative arrangement between Arizona State University, the State of Arizona and the United States Office of Education.

Associated Students

The Associated Students of Arizona State University (ASASU) is the student government for the University. ASASU has a strong presence at the University in a variety of ways. It is the official representative of the student body in matters of University governance and budgeting. Other programs and services include: the Faculty/Course Evaluation Program; the Human Affairs Board; Legal Services; Speakers Bureau; Tenants' Association; Travel Bureau; Graphics and Advertising; Bike Co-Op; Campus Affairs Committee; College Councils and ASASU Senate; Consumer Services; Intramurals/Club Sports/Recreation, including 60 intramural sports for men and women; *Point* magazine;

Film Series; Concerts; Special Events Board; and other committees.

Student Organizations

Student organizations offer the opportunity to participate in leadership experiences and to explore areas of specific interest. Students are encouraged to consider the values of membership in an organized group. Each of the approximately 300 existing student organizations has its own membership requirements and University advisor. More detailed information regarding these organizations may be obtained from the Dean of Students Office.

Student Life and Activities

Listed below are some of the areas which provide programs and activities for students as participants or spectators.

Fraternities and Sororities. Fifteen sororities and 20 fraternities offer a range of opportunities for interested students. Programs are coordinated by the Interfraternity Council and Panhellenic Council to foster communication between houses, reward scholastic achievement, and promote university and community service projects.

Music. Performing organizations with the School of Music provide opportunities for involvement and credit, including Symphony Orchestra, Bands, University Choral Organizations and Opera Workshop.

Dance. Programs and concerts are presented by members of the University Dance Theatre. Interested students should arrange to audition.

Forensics. A Sun Devil Forensic squad, associated with Pi Kappa Delta, national forensic honorary, travels to trophy tournaments across the country. Permission of the Director of Forensics required.

Interpreters Theatre. Participants write, compile, and perform scripts for presentation in diverse on- and off-campus settings through the Department of Theatre.

Theatre. The University Theatre presents six to ten faculty-directed productions and the Student Experimental Theatre produces six student-directed productions each year.

Religious Activities. Various religious centers representing most major religious denominations are available in Tempe and provide students with the opportunity to participate in programs of religious worship and

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to meet other students through social activities.

Intercollegiate Athletics. The University is a member of the Pacific Athletic Conference (PAC 10), the National Collegiate Athletic Association, Western Collegiate Athletic Association, the Association of Intercollegiate Athletics for Women and both its regional and Arizona associations. Under the regulations of the Board of Regents, the respective association or conference listed above, and the University, intercollegiate athletics at Arizona State University is governed by a board of faculty, students, and staff. Policies are administered by the Department of Intercol-

legiate Athletics. All athletic grants-in-aid and scholarships are administered by the faculty committee on scholarships and student aid.

Alumni Association

Founded in 1894, the Alumni Association involves graduates and former students throughout Arizona and around the world. It communicates with all alumni and provides services to dues-paying members. The Alumni Center (601 E. Apache Blvd.) maintains more than 100,000 files of graduates. The Alumni Association strives to promote effective interest in and loyalty to Arizona State University on the part of alumni and the general public.



College of Liberal Arts

Guido G. Weigend, Ph.D.

Dean

The College of Liberal Arts provides the student with an opportunity to obtain a broad, balanced, liberal education. In order to guide his/her 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; rather, it offers breadth and depth of education which will make the student attractive to employers in a great variety of private and public enterprises as well as prepare him or her for a culturally enriched life.

Within the framework of the curriculum, students, with the assistance of faculty advisors, determine their own progress to fit their particular aims. Vocational interests are taken into consideration within this context, and students may prepare for professional schools, graduate work, or particular careers. Final responsibility for meeting the requirements for graduation in a chosen field rests with the student.

Degrees

At the undergraduate level, instruction in the College of Liberal Arts offers programs leading to the degrees of Bachelor of Arts and Bachelor of Science.

The curricula for these degrees are 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. The curriculum for the Bachelor of Arts degree emphasizes breadth of studies, while the curriculum for the Bachelor of Science degree permits a somewhat greater extent of specialization in a selected area of scientific endeavor.

Admission to the College of Liberal Arts

Any student who has met the minimum requirements for admission to the University (see pages 17 - 20) and who wishes to major in a subject offered within the College of Liberal Arts, or who wishes to register in Pre-Secondary Education will be admitted to the College of Liberal Arts.

Any student with a cumulative grade point average of at least 2.0 who is currently registered in another college at Arizona State University and who wishes to major in a subject offered within the College of Liberal Arts or to register in the pre-professional curriculum listed above may transfer into the College by making application in the Dean's Office, Social Sciences Building, Room 111.

Transfer Credits

Students from accredited four-year 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 for the curriculum pursued at Arizona State University. Such credit will be accepted at the level indicated on the transcript of the transferring institution.

Courses transferred from two-year (community) colleges will not be accepted as upper-division credit. Students are urged to choose their community college courses care-

fully, in view of the fact that a minimum of 50 semester hours of work taken at the University must be upper-division credit (see page 39).

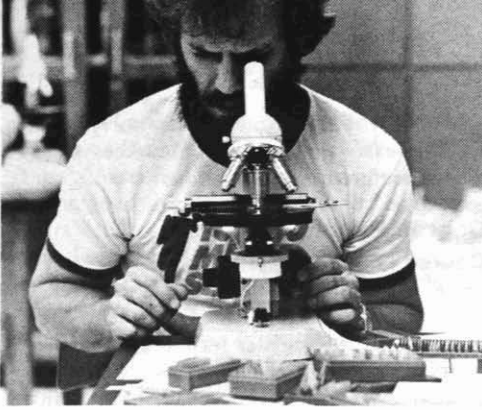
Major Fields of Study

Programs leading to the Bachelor of Arts and Bachelor of Science degrees are offered by the College of Liberal Arts, with major fields of specialization in the following subjects. Each field is administered by the academic department indicated.

MAJOR FIELD	DEGREE	DEPARTMENT
Anthropology	(B.A.)	Anthropology
Asian Languages-Chinese/Japanese	(B.A.)	Foreign Languages
Biology	(B.S.)	Botany and Microbiology; Zoology
Botany	(B.S.)	Botany and Microbiology
Chemistry	(B.A.,B.S.)	O.Chemistry
Computer Science†	(B.S.)	Computer Science
Economics*	(B.A.,B.S.)	Economics
English	(B.A.)	English
Entomology	(B.S.)	Zoology
French	(B.A.)	Foreign Languages
Geography	(B.A.,B.S.)	Geography
Geology	(B.A.,B.S.)	Geology
German	(B.A.)	Foreign Languages
Health Science	(B.S.)	Health and Physical Education
History	(B.A.,B.S.)	History
Home Economics	(B.A.,B.S.)	Home Economics
Humanities	(B.A.)	Philosophy and Humanities
Mathematics	(B.A.,B.S.)	Mathematics
Medical Technology	(B.S.)	Botany and Microbiology
Microbiology	(B.S.)	Botany and Microbiology
Philosophy	(B.A.)	Philosophy and Humanities
Physical Education	(B.S.)	Health and Physical Education
Physics	(B.S.)	Physics
Political Science	(B.A.,B.S.)	Political Science
Psychology	(B.A.,B.S.)	Psychology
Radiology	(B.S.)	Botany and Microbiology
Religious Studies	(B.A.)	Religious Studies
Russian	(B.A.)	Foreign Languages
Sociology	(B.A.,B.S.)	Sociology
Spanish	(B.A.)	Foreign Languages
Speech and Hearing Science	(B.S.)	Speech and Hearing Science
Wildlife Biology	(B.S.)	Zoology
Zoology	(B.S.)	Zoology

†The Department of Computer Science is located administratively in the College of Engineering and Applied Sciences. The Bachelor of Science degree with a major in Computer Science is offered by both the College of Liberal Arts and the College of Engineering and Applied Sciences. Requirements differ according to college (see page 72 and page 229).

*The Department of Economics is located administratively in the College of Business Administration. The Bachelor of Science degree with a major in Economics is offered by both the College of Liberal Arts and the College of Business Administration. Requirements differ according to college (see page 72 and page 173).



Teacher Certification for Liberal Arts

Majors-Secondary Education. A Liberal Arts student may obtain a Bachelor of Arts or a Bachelor of Science Degree in Liberal Arts and meet the State of Arizona requirements for teaching certification in Secondary Education. The student must meet all requirements established by the Arizona Department 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 further information regarding the curriculum or certification the student may consult the Department of Secondary Education, Office of Student Services, in Payne Hall (Ed B-2). The curriculum leading to the Bachelor of Arts in Education is described in this catalog on pages 192-200.

Pre-Education Programs

The College of Liberal Arts offers pre-professional programs in cooperation with the College of Education. Any student planning to pursue the degree of Bachelor of Arts in Education, Pre-Secondary, shall register in the appropriate department in the College of Liberal Arts until he has qualified for admission to his planned professional course of study. Pre-Secondary Education advisement is described on page 48. See the appropriate section of this catalog for detailed requirements of the program in Education.

Advisement

Regular Advisement. A prospective student who already has selected a major field of specialization will ordinarily be assigned to an advisor selected from the faculty of the de-

Advisement for Other Pre-Professional Programs

A student who plans to enter one of the baccalaureate degree programs in the College of Liberal Arts, and who also plans to pursue post-graduate training in a professional field, will ordinarily be assigned an advisor from the faculty of the department of his/her major field of study. Special advisement is available for students planning to enter the following fields:

Professional Field

Bilingual Secretarial
 Dentistry*
 Foreign Service
 Law†
 Medicine*
 Ministry
 Occupational Therapy*
 Optometry*
 Osteopathy*
 Pharmacy*
 Physical Therapy*
 Podiatry*

Office Where Advisor Is Located

Department of Foreign Languages
 Pre-Health Professions, SS 107
 Department of chosen major
 Student Academic Affairs Office, SS 111
 Pre-Health Professions, SS 107
 Department of Philosophy and Humanities
 Pre-Health Professions, SS 107
 Pre-Health Professions, SS 107
 Pre-Health Professions, SS 107
 Pre-Health Professions, SS 107
 Pre-Health Professions, SS 107
 Pre-Health Professions, SS 107
 Pre-Health Professions, SS 107

These professional programs are not majors in themselves; that is, there are no majors called "pre-medical," "pre-law," etc. In each program the student must eventually select an established major in the College of Liberal Arts or in one of the other colleges.

*Students preparing for a career in these areas should register with the Secretary in the Office of Pre-Health Professions. No school in the State of Arizona offers a program in Dentistry, Occupational Therapy, Optometry, Osteopathy, or Podiatry. Students interested in pursuing these professions should confer with the pre-health professions advisor concerning out-of-state schools where they may complete their training.

†Students preparing for a career in law should register in SS 111.

partment offering that field. Questions relating to the assignment of an advisor should be taken either to the departmental office or to the Coordinator of Advisement, College of Liberal Arts, Social Sciences Building 111.

“No-Preference” Advisement Option. Students in the College of Liberal Arts who have not yet selected a major field of specialization may choose the “No-Preference Option” upon entering the College as a freshman or at any time thereafter until the semester in which 60 semester hours are earned. Students selecting this option will be assigned advisors through the Student Academic Affairs Office of the College of Liberal Arts, located in the Social Sciences Building, Room 111. During the semester in which they earn 60 credit hours, or before, students in consultation with their advisors select their majors and transfer into the appropriate department. Thereafter, they receive advisement from a faculty advisor 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 in completion of requirements.

Pre-Secondary Education Advisement. A student who is entering the Pre-Secondary Education program and has selected a proposed major teaching field (see page 46) from those subjects offered by the College of Liberal Arts, will be assigned an advisor within the department offering the major subject. Questions relating to the assignment of an advisor may be taken to the Student Academic Affairs Office, Social Sciences Building, Room 111.

Program of Studies

Students construct their own programs of studies in accordance with the degree requirements set forth below.

Advisement and academic counseling are freely available both in academic departments and in the Student Academic Affairs Office of the College of Liberal Arts; however, it is the student's responsibility to be aware of the requirements for a degree program and to plan course selections accordingly, giving due regard to prerequisite courses.

Chains of Prerequisites. Prerequisite course numbers marked with a dagger (†) have further prerequisites. Each student is cautioned to be aware of the existence of such chains of prerequisites and to plan course selections

accordingly. Failure to heed this warning may result in extra time and expense to complete degree requirements.

Degree Requirements

Course Load. The normal course load is 15-16 semester hours of credit. First-semester freshmen and entering transfer students are not permitted to register for more than 18 hours of credit in their initial semester. Other students who wish to register for more than 18 hours must have an average of at least 3.0 and must file a petition in the Student Academic Affairs Office, Social Sciences 111. Any petition for an overload in excess of 21 hours must be presented to the Standards Committee of the College. Unauthorized excess hours will be removed at random from the student's class list by administrative action.

Credit Requirement. All candidates for graduation in the Bachelor of Arts and Bachelor of Science degree curricula are required to present at least 126 semester hours of credit, of which at least 50 hours must consist of upper-division courses. A cumulative grade point index of 2.00 is required for graduation.

English Proficiency Requirement. All students must demonstrate reasonable proficiency in written English. If a student receives a grade of “C” or better in both ENG 101 and ENG 102, or in ENG 104 or its equivalent, he/she will be presumed to have demonstrated the necessary degree of writing proficiency. Students who receive a “D” in either course 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 ENG 102 or ENG 104 or the 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, students must repeat the above procedure until they have demonstrated the necessary degree of writing proficiency. Any questions concerning the English Proficiency Requirement should be addressed to the Director of Freshman English. Foreign students whose native language is not English may substitute ENG 111, ENG 112 for ENG 101, ENG 102.

Foreign Language Requirement. For the degree of Bachelor of Arts, the College of Liberal Arts requires knowledge of one foreign language equivalent to the completion of two years' study at the college level. A student who desires to fulfill the requirement in whole or in part through foreign language study in secondary schools may do so in accordance with the equivalency principles explained under Foreign Languages, Placement, page 79. 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.

Languages not taught at ASU may satisfy the foreign language requirement only if the student has passed a proficiency examination, or has transferred adequate credit from an approved college or university.

Students who have received their secondary education from a school where the language of instruction was other than English will be considered to have satisfied the foreign language requirement. Certification of this status will be made at the time of admission to Arizona State University. Questions should be addressed to the Foreign Credentials Evaluator in the Admissions Office.

The College of Liberal Arts does not require knowledge of a foreign language for the degree of Bachelor of Science. Some departmental curricula leading to the Bachelor of Science degree do, however, include knowledge of a foreign language among their degree requirements. Foreign languages taken to fulfill a departmental requirement for the Bachelor of Science degree may be used to satisfy the minimum General Studies requirement in Humanities and Fine Arts.

General Studies Requirement

In order to obtain a baccalaureate degree through the College of Liberal Arts, the student must take a minimum of 54 semester hours of credit in the subjects and areas listed below. Courses in the subject field of the major may not be used toward this requirement, but courses in related fields may be used even if they are considered to be part of the major requirement. Pass-Fail credit cannot be used for these courses.

The General Studies requirement for the College of Liberal Arts is more extensive than the minimum requirement for graduation from the University (see page 36). The latter requirement will automatically be fulfilled by

any student who completes the requirement for Liberal Arts.

To assure breadth and encourage depth within the degree requirements, all Liberal Arts students must meet the following minimum distribution patterns in the following three areas:

- 1) Humanities and Fine Arts—12 semester hours,
- 2) Social and Behavioral Sciences—12 semester hours,
- 3) Science and Mathematics—12 semester hours,

and additional courses selected from the lists below for the total of 54 credits. Courses offered by any single department—ASB/ASM, GCU/GPH and PGS/PSY—may be used to fulfill the minimum respective requirement in *either* Social and Behavioral Sciences *or* Science and Mathematics, but not both.

Humanities and Fine Arts. Only courses offered by the following departments may be used toward fulfilling the minimum 12-hour requirement.

- Architecture (APH and DES 100, 101 courses *only*)
- Art (ARH courses *only*)
- Communication (COM 241 *only*)
- Dance (DAH courses *only*)
- English (any course except ENG 101, 102, 104, 111, 112)
- Foreign Languages (any course except those below 300 used to satisfy the language requirement for the Bachelor of Arts degree)
- Music (MHL; MTC and MUS courses *only*)
- Philosophy and Humanities (PHI and HUP courses *only*)
- Religious Studies
- Theatre (THE courses *only*)

Social and Behavioral Sciences. Only courses offered by the following departments may be used toward fulfilling the minimum 12-hour requirement.

- Anthropology (ASB courses *only*)
- Economics
- Geography, Cultural (GCU courses *only*)
- History
- Political Science
- Psychology (PGS courses *only*)
- Sociology

Science and Mathematics. Only courses offered by the following departments may be used toward fulfilling the minimum 12-hour requirement. At least one course must include a scheduled laboratory of at least 30 class

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hours per semester in natural science. At least six hours must be taken in one department.

Anthropology (ASM courses *only*)

Botany and Microbiology (all BIO, BOT, and MIC courses)

Chemistry

Geography, Physical (GPH courses *only*)

Geology

Mathematics (may not be used to satisfy laboratory requirement)

Physics (PHY, AST, and PHS courses *only*)

Psychology (PSY courses *only*)

Zoology (all BIO, ENT, and ZOL courses)

Additional Courses. To complete the 54-hour requirement, additional courses may be taken from the lists above, and from the following optional group:

Aerospace Studies (maximum of 6 hours of ROTC credit)

Art (except ARE)

Communication

Criminal Justice (maximum of 6 hours)

Dance (DAN 130, 230, 330 *only*; a maximum of 4 hours in DAN and PED activities courses).

Health and Physical Education (HES 100, 382; PED 105, 205, 305 [a maximum of 4 hours in PED and DAN activities courses]; PED 450 *only*).

Home Economics (CDE 232; DEH 171, 271, 272, 472, 474; FON 141; FAS 330, 331, 354, 357, 435; TXC 122, 424 *only*)

Interdisciplinary (LIA courses in Liberal Arts, see page 105)

Journalism and Telecommunication

Leisure Studies (REC 160 *only*)

Military Science (maximum of 6 hours ROTC credit)

Music (except MUE)

Social Work (SWU 474 *only*)

Speech and Hearing Science

Theatre

Major Field of Study. Each candidate for the degree of Bachelor of Arts or Bachelor of Science must complete requirements for a major field of study, as established by the department concerned. The specific course content of the major is selected by the student in consultation with the advisor under the rules and regulations of the department.

For the degree of Bachelor of Arts, the major and related fields requirement consists of a total of 45 semester hours of credit. A maximum of up to 36 semester hours may be required in the subject field of the major. Stu-

dents should consult departmental listings for specific requirements in major and related fields.

For the degree of Bachelor of Science, the major field of study may require up to a maximum of 45 semester hours of credit in the subject field of the major, plus additional related studies.

No credit will be granted toward fulfilling major requirements in any upper division course in the subject field of the major unless the grade in that course is at least a "C".

Special Credit Options

Pass/Fail Grade Option

- I. The Pass/Fail option is intended to broaden the education of Liberal Arts undergraduates by encouraging them to take advanced courses outside their specialization. A mark of "P" contributes to the student's earned hours but does not affect the grade point average. A failing grade is computed into the GPA.
- II. Only Liberal Arts students with 60 hours of credit may take courses under the Pass/Fail option.
- III. The option may be used under the following conditions:
 1. Enrollment for Pass/Fail must be indicated during registration and may *not* be changed after the late registration period.
 2. Students may *not* enroll for Pass/Fail in courses which are:
 - a) Taken to satisfy the Foreign Language or English Proficiency requirements.
 - b) In the student's major.
 - c) Counted toward or required to supplement the major.
 - d) Counted as Independent Study 499.
 - e) Taken for Honors credit.
 - f) Counted toward satisfying the 54 hours of General Studies.
 3. A maximum of 12 hours taken for Pass/Fail may be counted toward graduation.
- IV. Above option is not available to Liberal Arts students for courses offered by other colleges except for courses in economics offered by the College of Business Administration.

**Formerly listed as "Credit-No Credit."*

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 the privilege of taking 500-level graduate courses for undergraduate credit. The application must be approved by the advisor, the instructor of the 500-level graduate course, and the chair of the department.

Students who transfer to professional or other graduate colleges before receiving an undergraduate degree may not transfer credits back to Arizona State University to be applied to a degree *in absentia*.

Academic Standards and Retention

Standards. The College of Liberal Arts standards for grade point average (GPA) and the terms of probation, disqualification, reinstatement, and appeal are identical with those of the University as set forth on page 35 of this catalog, except that the disqualified student is suspended for at least *two* regular semesters at the University.

Academic discipline is one of the functions of the Student Academic Affairs Office, Social Sciences Building, Room 111. All students who are having academic difficulties of any kind should maintain close contact with this office.

Probation and Disqualification. Appeals with respect to academic probation or disqualification may be addressed to the Academic Standards Committee of the College of Liberal Arts. Petitions should be submitted to the Student Academic Affairs Office, Social Sciences Building, Room 111.

Special Programs

Honors Program. The College of Liberal Arts provides a full four-year Honors Program which affords the superior undergraduate with opportunities for an enhanced liberal arts education and in-depth experiences in his or her major field. Characteristic of the program is the personal attention given to each student by members of the Honors Faculty, who are selected from among the leading scholars and teachers in the College. In instructing specially-designed Honors courses, and in supervising individual study and Honors Theses, the faculty share an enthusiasm for working with talented and motivated students.

Admission to the Honors Program:

Entering Freshmen. Entering freshmen who are in the top 5% of their high school graduating class, or who have an ACT composite score of 27 or better, or who can demonstrate similar indications of academic aptitude, are invited to apply for admission to the program upon entrance.

Continuing and Transfer Students. A continuing or transfer student who has completed at least 15 credit hours of study with a 3.25 cumulative grade average or better may, with the recommendation of his or her academic advisor, apply for admission to the program.

Retention in the Honors Program. An Honors student must maintain exceptionally high standards of performance while in the program, demonstrating evidence of progress toward satisfying the requirements for graduation from the program (see below). It is expected that an Honors student will register for at least one Honors course each semester in order to obtain full benefit from the program. An Honors student may leave the program at any time. All courses taken while in the program will count toward graduation from the University.

Graduation With Honors. To graduate with Honors, a student must:

Attain a cumulative grade average of at least 3.40;

Satisfy departmental major requirements, including major honors requirements where they exist, and College General Studies requirements;

Complete a minimum of 18 hours of Honors credit, of which at most 6 can be XXX-493 (Honors Thesis), and of which at least 6 must be upper-division credit in non-major areas;

Write a senior thesis and pass an oral thesis defense.

For additional information, the interested student should contact the Director, Honors Program, College of Liberal Arts, Social Sciences Building, Room 103.

Interdisciplinary Studies

Within the framework of a regular major chosen from those listed on page 16, students may, in consultation with their advisors, use courses outside the major subject field to put together a program of interdisciplinary studies. Recommended programs in American Studies, Asian Studies, Islamic Studies, Latin

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American Area Studies, and Women's Studies are described below. Students may contact the Dean's Office for further information.

American Studies. The development of insight into the complexities and inner workings of modern American society is a unique interdisciplinary task for which universities are especially suited. The Arizona State University program fosters and coordinates activities with this objective. The program emphasizes courses in the study of history, cultures and problems of specific groups in America.

In addition, the program includes seminars, public lectures, and related extracurricular activities. Inquiries about the program should be directed to the Coordinator of the American Studies Program, Social Sciences Building, Room 109.

Asian Studies. The Center for Asian Studies is designed to encourage and coordinate student, faculty and community study of the area through the support of public lectures, symposia, research and curricular development. Interdisciplinary programs have been developed, both undergraduate and graduate, to prepare students for governmental or private employment or for admission to graduate programs at other institutions.

At the undergraduate level, programs can be devised leading to an emphasis within a major. Example: History-Asian Studies, Anthropology-Asian Studies. Any department in the University may, at its discretion, accept an Asian Studies component. The goal is to offer programs which, while insuring a rigorous training for students in their chosen field of study, will enable them to relate their discipline to Asian conditions and problems.

The requirements for Asian Studies in such an emphasis are 30 semester hours of wholly Asian content courses, and knowledge of an Asian language. The 30 semester hours of Asian courses shall be selected from the list of Asian courses drawn up by the Center. These courses may be used where appropriate to fulfill General Studies requirements. Knowledge of an Asian language shall comprise the equivalent of 20 semester hours of credit in Chinese, Japanese, or any other Asian language approved by the Center for a particular individual program. Fulfillment of these requirements will be recognized on the transcript by a bachelor's degree with a major in "(Discipline)-Asian Studies."

At the graduate level, the Center for Asian Studies cooperates with a number of departments in master's and doctoral programs. At the M.A. and Ph.D. levels the cooperating departments are Political Science, History, Anthropology, Geography and Sociology. At the M.A. level only, the departments include Philosophy and Humanities, and Religious Studies. In cooperation with the College of Education, the Center offers two graduate programs to prepare teachers of Asian Studies for the high schools and community colleges. One program is the Master in Education—Secondary Education with a major field in Asian Studies consisting of 30 credit hours: 15 each in Asian Studies and Education. The other is Teaching Specialist in Asian Studies (within the Education Specialist degree program), which requires 36 hours beyond the M.A. degree: 18 each in Asian Studies and Education. Consult the Chair of the Secondary Education Department or the Director of the Center.

The Center cooperates and coordinates with other university centers in the summer or in one-year study programs in several Asian countries.

The Center also publishes occasional papers or reports and symposium proceedings, all of which are distributed throughout the world.

For further information consult the Director of the Center for Asian Studies.

Asian Studies Courses. *For course descriptions refer to the course offerings by departments.*

ARH	201	Non-Western Art
ARH	294	Special Topics, where appropriate
ARH	470	Art of India
ARH	471	Art of China
	472	Art of Japan
ARH	474	Chinese Painting
ARH	494	Special Topics, where appropriate
ARH	498	Pro-Seminar, Chinese Art/Islamic Art
ARH	591	Seminar, Chinese Art/Islamic Art
ARH	598	Special Topics
ASB	323	Peoples of Asia
ASB	325	Peoples of Southeast Asia
CHI	101	Elementary Chinese
	102	
CHI	201	Intermediate Chinese
	202	

CHI	205	Chinese Calligraphy	JPN	101	Elementary Japanese
CHI	294	Special Classes		102	
CHI	309	Chinese Conversation	JPN	201	Intermediate Japanese
	310			202	
	311		JPN	206	Calligraphy
	312		JPN	294	Special Courses
CHI	313	Advanced Chinese	JPN	309	Intermediate Japanese Conversation
	314			310	
CHI	321	Chinese Literature	JPN	311	Japanese Conversation
	322			312	
CHI	413	Introduction to Classical Chinese	JPN	313	Advanced Japanese
	414			314	
CHI	492	Special Courses	JPN	321	Japanese Literature
	493			322	
FLA	420	Foreign Literature in Translation: One Chinese Section	JPN	414	Introduction to Classical Japanese
FLA	150	East Asian Cultures	JPN	492	Special Courses
FLA	420	Foreign Literature in Translation: One Japanese Section One Chinese Section		493	
				494	
				499	
				590	
GCU	326	Geography of Asia	MHL	545	World Music II
GCU	428	Geography of the Middle East	PHI	319	Indian Philosophy
GCU	531	Geography of the Far East	PHI	321	Buddhist Philosophy
HIS	105	China: Literature and Revolution	POS	445	Asian Political Thought
HIS	106	The People's Republic of China	POS	448	Comparative Politics of China and Japan
HIS	305	Asian Civilization	POS	452	Government and Politics of China
	306		POS	458	Government and Politics of South and Southeast Asia
HIS	470	Chinese Cultural History	POS	468	Comparative Asian Foreign Policies
HIS	471	Diplomatic History of East Asia	POS	250	Special Courses
	472			492	
HIS	473	China		493	
	474			498	
HIS	475	Modern India		499	
HIS	476	Modern Southeast Asia		590	
HIS	477	Japan		591	
	478			598	
HIS	479	The Chinese Communist Movement	REL	121	Religions of the World
HIS	494	Special Topics: Asian History	REL	351	Hinduism and Buddhism
HIS	498	Pro-Seminars on Modern China and Japan	REL	352	Confucianism and Taosim
HIS	590	Reading and Conference: China	REL	451	Religions of India
HIS	591	Seminar: China	REL	453	Zen
HUP	150	Introduction to East Asian Cultures	REL	454	Hindu Religious Thought
HUP	313	Comparative Arts of the East—China	REL	455	The Religion in Japan
HUP	314	Comparative Arts of the East—India or Japan	REL	598	Special Topics
HUP	505	Esthetic Principles in Eastern	SOC	498	Pro-Seminar: Topics to be selected
	506	Humanities	SOC	590	Pro-Seminar: Topics to be selected
HUP	507	Comparative Esthetics: East/West	SOC	592	Pro-Seminar: Topics to be selected
			THE	425	History of the Oriental Theatre

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Islamic Studies. Although the Middle East is frequently in the news, the West has much to learn about the history and cultures of its peoples. Arizona State University faculty members with special expertise in Islam offer courses in several departments, as well as an interdisciplinary course on Islamic Civilization. Numerous programs, guest speakers and art exhibitions on the Islamic world are brought to the campus. For further information, contact the History Department, SS 204.

Islamic Studies Courses. *For course descriptions refer to the course offerings by departments.*

- ARH 105 Introduction to Islamic Art
- ARH 476 Islamic Architecture
- ARH 477 Islamic Painting
- ARH 478 Persian Art
- ARH 598h Pro-Seminar: Islamic Art
- ARH 591h Seminar: Islamic Art
- GCU 428 Geography of Middle East
- HIS 437 Eastern Europe and the Balkans
- HIS 439 The Modern Middle East
- HIS 456 Iberian Empires
- REL 312 Western Religious Traditions
- REL 460 Religious Traditions of Islam
- REL 464 The Sufi Way

Team-taught interdisciplinary course: ARA, HUP or REL 365 Islamic Civilization.

(For special topics courses (494) and independent studies (499) on Islamic and Middle Eastern subjects, consult departments indicated above.)

Latin American Area Studies. Arizona maintains an ever-growing interest in Latin America that draws upon an extensive experience of historical and geographical ties. The Center for Latin American Studies is the focal point for these interests at Arizona State University, and through its program endeavors to serve the University community and maintain strong ties with various Latin American organizations in the state and the nation. Principal activities are coordinating Latin American Studies at the undergraduate and graduate levels; sponsoring student exchange programs, a Guatemalan Summer School, numerous seminars and conferences; publishing a wide range of professional materials; and facilitating research about the region.

The Latin American Area Studies program is designed to give students an understanding of public affairs, culture, and national trends

in Latin American nations and is offered as a combined degree program in cooperation with the departments of Anthropology, Economics, Geography, History, Political Science, and Foreign Languages (Spanish), as well as the College of Business Administration. In this program the student majors in one of the cooperating departments, completing the degree requirements of that particular discipline. At least 30 upper division semester hours of the total program must be in Latin American content courses, 15 hours in the major and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required. The 15 hours required in other disciplines shall be selected from the list of Latin American content courses established by the Center (a list of courses follows). The program must be approved by the Center for Latin American Studies. Fulfillment of the requirements of this program of study is recognized on the transcript as a bachelor's degree with a major in "(Discipline) — Latin American Studies."

Master's degree students in the departments of Geography, History, Political Science, or Spanish may elect an emphasis in the field of Latin America. Two departments, History and Foreign Languages, offer Latin American areas of focus at the Ph.D. level. A cognate minor in Latin American studies is also available in various disciplines.

The Center administers student exchange programs with the Catholic University of Bolivia and three Mexican universities—the Autonomous University of Guadalajara, the Autonomous University of Nuevo Leon, and the University of Sonora. Each semester several ASU students are selected to receive credit for course work taken on the Latin American campuses while Bolivian and Mexican students study here. In the summer, the Center sponsors a summer school at the University of Francisco Marroquín in Guatemala City.

Each year the Center typically sponsors several major conferences as well as a number of seminars, often featuring presentations by scholars from Latin America.

The extensive publications program includes the issuing of the quarterly *Latin American Digest*, as well as the publication of research through the Reference Series, Reprint Series, and Special Studies Series. Several scholarly books are published each year.



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The Center is a member of the Arizona-Mexico Commission, the Border States University Consortium for Latin America, the Consortium for Latin American Studies Programs, the Latin American Studies Association, the Rocky Mountain Council on Latin American Studies, the Pacific Coast Council on Latin American Studies, and the Southwest Alliance for Latin America. It also serves as the unofficial home of the ASU Association of Latin American Students.

The Center directly encourages research, not only through its publications program, but also through the maintenance of a Latin American newspaper reading room.

For further information consult the office of the Center for Latin American Studies, Room 213, Social Sciences Building.

Latin American Content Courses. *For course descriptions refer to the course offerings by departments.*

ARH	110	Introduction to American Art	HIS	459	Changes and Reform: Colonial Latin America
ARH	403†	Pre-Columbian Art	HIS	460	Spanish South America
ARH	406†	Mexican Art		461	
ASB	321†	Southwestern Ethnology	HIS	463	Intellectual and Cultural History of Latin America
ASB	335	Southwestern Anthropology	HIS	464	The United States and Latin America
ASB	337	Archaeology of Mesoamerica	HIS	466	Mexico
ASB	419†	Social Inequality		467	
ASB	423†	Archaeology of South America	HIS	468	Brazil
ASB	424†	Indians of Mesoamerica	HIS	514	Latin American Historiography
ASB	479†	The Anthropology of Peasant Peoples	HIS	591	Seminar (Latin American History)
ECN	311†	Economic Development	LIS	465	Library Materials for Minority Students
ECN	331†	Comparative Economic Systems	MCE	448	The Mexican-American Child
ECN	336†	International Economics	MCE	498	Minority Women
ECN	371†	Latin American Economics	MCO	430	International Communications
ECN	488†	International Monetary Economics	MGT	459†	International Management
ECN	570	Economics of Developing Nations	MHL	544	World Music I
GCU	323	Geography of Latin America	MKT	331†	International Business
GCU	423†	Geography of South America	MKT	435†	International Marketing
GCU	424†	Geography of Middle America	MKT	591	Seminar (International Business)
HIS	200	Latin American Civilization (not open to history majors)	POR	321†	Luso-Brazilian Literature
HIS	380	History of the Mexican American	POR	472†	Luso-Brazilian Civilization
HIS	383	Latin America	POS	428	Comparative Administration
	384		POS	435	Modernization and Political Change
HIS	424	The Hispanic Southwest	POS	438	Revolution and the Social System
HIS	430	20th Century Chicano History	POS	453	Government and Politics of South America
HIS	456	History of Spain	POS	454	Government and Politics of Mexico
	457		POS	455	Government and Politics of Central America and the Caribbean
HIS	458	Age of Conquest: Latin America	POS	460	World Politics
			POS	463	Inter-American Relations
			POS	465	International and Regional Organizations
			POS	467	Comparative Defense Policy
			POS	474	International Law
			POS	550	Comparative Governments
			POS	591	Seminar (Comparative Government; International Relations)
			SOC	401	Comparative Sociology
			SPA	325†	Introduction to Hispanic Literature
			SPA	421†	Spanish in the Southwest
			SPA	424†	Masterpieces of Hispanic Literature
			SPA	427†	Spanish-American Literature
				428†	

SPA	454†	19th Century Spanish-American Narrative
SPA	455†	Spanish-American Modernism
SPA	456†	20th Century Spanish-American Fiction
SPA	457†	Contemporary Spanish-American Poetry
SPA	464†	Mexican-American Literature
SPA	471†	Civilization of the Spanish Southwest
SPA	472†	Spanish-American Civilization
SPA	541	Spanish Language in America
SPA	542	Studies in the Spanish of the Southwest
SPA	570	Indigenous Literature of Spanish America
SPA	571	Colonial Spanish American Literature
SPA	572	Spanish-American Drama
SPA	573	Spanish-American Essay
SPA	574	Spanish-American Vanguard Poetry
SPA	575	Contemporary Spanish-American Novel
SPA	576	Contemporary Spanish-American Short Story
SPA	577	Regional Spanish-American Literature
SPA	579	18th Century Hispanic Literature
SPA	591	Seminar
SPF	534	Education and Change in Developing Nations
TRA	463†	International Transportation

†Denotes prerequisites

Several departments offer additional Latin American content courses under the following designations: special topics 494, honors colloquium 497, pro-seminar 498, reading and conference 590, seminar 591, and special topics 598. Students should consult a schedule of classes for the availability of these courses. In addition, the University offers Latin American content courses for law students and doctoral students in several departments.

Medieval and Renaissance Studies. In recognition of the need for period as well as subject area specialization, faculty members with research interests in Medieval and Renaissance Studies offer a number of courses in these areas from which students may develop an interdisciplinary course of study. Faculty members, working within the framework of the Arizona Renaissance and Medieval Society (ARMS), sponsor lectures and offer courses in history, philosophy and humanities,

religious studies, music, art, literature, (English, French, German, Italian, Scandinavian, and Spanish). *JRMMRA*, the journal of the Rocky Mountain Medieval and Renaissance Association, is sponsored jointly by the Colleges of Liberal Arts at both Northern Arizona University and Arizona State University.

For specific course information and advisement, see the following Medieval and Renaissance Studies advisors:

Art	A. Gully
English	J. Brink
French	W. Hendrickson
German	
and Scandinavian	W. Senner
History	K. Dannenfeldt
History of Science	R. Alvarado
Italian	P. Baldini
Music	R. Reynolds
Philosophy	M. White
and Humanities	B. Doebler
Religious Studies	R. Rader
Spanish	E. Friedman
Theatre	W. Akins

Women's Studies. The curriculum of Women's Studies involves courses from colleges throughout the University. The Women's Studies program is designed to:

1. Examine the central issue of the quality and shape of woman's experience;
2. Provide a model for interdisciplinary teaching and research;
3. Generate and facilitate research on woman's experience;
4. Provide the University and the community with programs, courses and research which acknowledge and expand the potential of women; and
5. Stand as a visible example of the University's commitment to change in the status of women—students, faculty and staff—within the University and the larger society.

A Certificate of Concentration in Women's Studies may be awarded for the successful completion of the introductory course, Women and Society, plus 18 additional credits from the list of approved Women's Studies courses, only six of which may also be applied toward the student's major. Credit for additional related courses may be accepted upon petition to the Women's Studies Advisory Committee.

For some students in the College of Liberal Arts, the courses in this concentration may be accepted as fulfilling the related field require-

ments. Students who wish to take advantage of this option should consult the Director.

Inquiries about the program should be addressed to the Women's Studies Resource Center, Social Sciences 103, where the current list of approved courses is available.

Solid State Science. As a separate academic unit within the College of Liberal Arts, the Center for Solid State Science is engaged in research in many aspects of the physics, chemistry and applications of solids. The Center operates modern research facilities, sponsors a colloquium series, maintains a library of research publications and works cooperatively with local industry. While the Center itself does not grant degrees, it does provide opportunities for both graduate and undergraduate students to do research in this cross-disciplinary area. Students would include this research activity as part of a program of study within one of the departments, normally Chemistry and/or Physics, under the supervision of one of the faculty members of the department or of the Center.

Aerospace Studies

(Air Force ROTC)

PROFESSOR:
KECK (MAIN 340)

ASSISTANT PROFESSORS:
BROWN, COOPER, GAMBONE

Purpose. The Department of Aerospace Studies curriculum consists of the General Military Course for freshmen and sophomores (GMC-AES 101, 102, 201, 202) and the Professional Officer Course for juniors and seniors (POC-AES 301†, 302†, 401†, 402†). The goal of this professional education is to provide the foundation of military knowledge and skills needed by Air Force junior officers. Upon graduation, each student who satisfactorily completes the Professional Officer Course and degree requirements will receive a commission as a Second Lieutenant in the Air Force Reserve.

General Qualifications. Men or women entering AFROTC must: (1) be a 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 scholarship ap-

pointment or admittance to the POC.

Additionally, scholarship recipients must be able to fulfill commissioning requirements by age 25. If designated for flying training, the student must be able to complete all commissioning requirements prior to age 26½; other categories must be able to complete all commissioning requirements prior to age 30.

Four-Year Program (GMC and POC). A formal application is not required for students entering the Four-Year Program. A student may enter the program by simply registering for one of the General Military Course (GMC) classes at the same time and in the same manner as other courses. GMC students receive 2.0 semester hours of credit for each AES 100 and 200 class completed; a total of 8.0 semester hours. GMC students not on AFROTC scholarship incur no military obligation. Each candidate for commissioning must pass an Air Force aptitude test and a physical examination 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. Students normally attend a four-week field training course at an Air Force base between the sophomore and junior year. 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 may be granted an educational delay to pursue graduate work.

Two-Year Program (POC). 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. Applicants seeking enrollment in the two-year program must pass an Air Force aptitude and 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.

Qualifications for Admittance to the Professional Officer Course (POC). (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").

Deposit. All non-contract students registering for Air Force ROTC are required to make a deposit of \$20 with the military property custodian as the basis for issue of the prescribed uniform, textbooks, and other authorized materials. This deposit will be refunded at the end of each semester by the military property custodian.

Pay and Allowances. POC members in their junior and senior years receive \$100 per month for a maximum of 20 months of Professional Officer Course attendance. Students are also paid to attend field training. In addition, uniforms, housing and meals are provided during field training at no cost to the student. Students are reimbursed for travel to and from field training.

Scholarships. Air Force ROTC offers 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 \$100. Scholarships are available on a four-, three-, and two-year basis. To qualify for the four-year scholarship, students must be citizens and submit an application prior to December 15 of their senior year in high school. Interested students should consult their high school counselors or call AFROTC at ASU for application forms to be submitted to HQ, AFROTC, Maxwell AFB, AL., 36112. Male and female students enrolled in AFROTC at Arizona State University are eligible for three- and two-year scholarships. Those interested must apply through the Department of Aerospace Studies. Consideration is given to academic grades, score achieved on the Air Force Officer Qualifying Test and physical fitness. A board of officers considers an applicant's personality, character and leadership potential.

Flight Instruction Program. Senior cadets designated to enter U.S. Air Force Undergraduate Pilot Training after graduation participate in the Flight Instruction Program (FIP) during their last year in college unless they already have a private pilot's license. Each cadet receives 25 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.

AEROSPACE STUDIES

AES 101 Aerospace Studies. (2) F

Introduction to U.S. Air Force organization, mission, doctrine, offensive and defensive forces. One lecture, 1 hour Leadership Practical Application (101L).

102 Aerospace Studies. (2) S

Background on strategic missile defense forces, general purpose and aerospace support forces in national defense. One lecture, 1 hour Leadership Practical Application (102L).

201 Aerospace Studies. (2) F

Historical survey of events, trends, and policies leading to the emergence of air power through WW II. One lecture, 1 hour Leadership Practical Application (201L).

202 Aerospace Studies. (2) S

Development of aerospace power from WW II to the present emphasizing the impact of limited war and technology on roles and missions. One lecture, 1 hour Leadership Practical Application (202L).

301 Aerospace Studies. (3) F

An integrated management course emphasizing the individual as a manager in an Air Force milieu. Individual motivational and behavioral processes, leadership, communication and group dynamics are covered. Two lectures, 1 hour Leadership Practical Application (301L).

302 Aerospace Studies. (3) S

Organizational and personal values, management of forces in change, organizational power, politics, managerial strategy and tactics. Two lectures, 1 hour Leadership Practical Application (302L).

401 Aerospace Studies. (3) F

Armed Forces as a technical element of society, with emphasis on the broad range of American civil-military relations; principles and techniques of communicative skills; the political, economic and social constraints on the national defense structure. Two lectures, 1 hour Leadership Practical Application (401L).

402 Aerospace Studies. (3) S

Formulation and implementation of U.S. defense policies; impact of technological and international developments on strategic preparedness in the overall defense policymaking processes. Two lectures, 1 hour Leadership Practical Application (402L).

403 Flight Instruction. (0) F,S

Flight instruction (25 total hours of dual and solo instruction); 8 hours ground school. Prerequisites: AES 301, 302 and enrollment in POC.



Anthropology

PROFESSORS:

PLOG (ANTH A-124), BAHR, DITTERT, MERBS, MORRIS, RUPPÉ, SCHOENWETTER, TURNER

ASSOCIATE PROFESSORS:

BRANDT, CLARK, FIRESTONE, FOSTER, MARTIN, NASH, STARK

ASSISTANT PROFESSORS:

AGUILAR, EDER, GAINES, STEADMAN, WILLIAMS

LECTURER:

CAIN

Departmental Major Requirements Bachelor of Arts Degree Curriculum

Anthropology—Consists of 45 semester hours of credit of which 30 must be in anthropology and 15 in related fields to be approved by the advisor in consultation with the student. Courses ASM 101, ASB 102, 311, 331†, and one area course incorporating ethnography are required. Students may elect ASM 341†, 342†, or 343† to fulfill the required course in physical anthropology. 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. (See Graduation Requirements, page 39.)

Latin American Studies Combined Degree Program. (See Interdisciplinary Studies, page 54)—Consists of the Bachelor of Arts degree requirements in Anthropology. At least 30 upper division semester hours of the total program must be in Latin American content courses including 15 hours in Anthropology and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a Bachelor of Arts degree with a major in Anthropology—Latin American Studies.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Social Studies: Anthropology—Consists of 63 semester hours of credit, of which 30 hours

must be in the anthropology courses required for the Bachelor of Arts degree in Liberal Arts. Of the remaining hours, two groups of 15 hours are to be taken in related social sciences. Psychology or a single natural science may be used as one of the 15 hour fields. SED 480 is taken to provide the remaining 3 hours.

	<i>Semester Hours</i>
Anthropology	30
Social sciences	15
Social sciences or natural sciences or psychology	15
SED 480 (Special Methods of Teaching Social Studies)	3
	63

Departmental Minor Teaching Field Requirements (Secondary Education)

Anthropology—Consists of 24 semester hours of credit in anthropology. Courses ASM 101, ASB 102, and two upper division courses in each subdisciplinary field (archaeology, physical anthropology, social-cultural anthropology) are required.

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.

ANTHROPOLOGY (ASM)

Courses which may be applied toward the General Studies requirement in sciences and mathematics.

ASM 101 Human Origins and the Development of Culture. (3) F, S

Physical anthropology and archaeology. Evidence and processes of human evolution and of culture change. Primates. Fossil hominids and their tools. Race, variation and heredity. Environment and human biology. Prehistoric culture and society.

241 Biology of Race. (3) F, S

Human variation and its interpretation in an evolutionary context.

338 Anthropological Field Session. (2-8) SS

Anthropological field techniques, analysis of data and preparation of field reports. Prerequisite: approval of instructor. May be repeated for credit.

341 Human Osteology. (4) F

Osteology, human paleontology, osteometry. Description and analysis of archaeological and contemporary human populations. Prerequisite: ASM 101 or approval of instructor. Three lectures, 3 hours laboratory.

342 Human Biological Variation. (4) S

Evolutionary interpretations of biological variation in living human populations with emphasis on anthropological genetics and adaptation. Nutrition and disease, and their

relation to genetics and behavior. Prerequisites: ASM 101, MAT 106 or equivalent, or approval of instructor. Three lectures, 3 hours laboratory.

343 Primatology. (3) F

Evolution and adaptations of nonhuman primates emphasizing social behavior. Includes material from fossil evidence and field and laboratory studies in behavior and biology. Prerequisite: ASM 101 or approval of instructor.

344 Fossil Hominids. (3) N

Ancient African, Asian, and European human and primate skeletal, dental, and cultural remains. Human biological, behavioral, and cultural evolution. Prerequisite: ASM 101 or approval of instructor.

345 Disease and Human Evolution. (3) F

Interaction of people and pathogens from prehistoric times to the present with emphasis on disease as an agent of genetic selection. Prerequisite: ASM 101 or approval of instructor.

346 Human Origins. (3) S

Humanity's place in nature, fossils, historic and recent concepts of human races, influence of culture on human evolution.

348 Social Issues in Human Genetics. (3) S

Moral and social implications of developments in genetic science, particularly as they affect reproduction, medicine and evolution.

365 Laboratory Methods in Archaeology. (4) N

Techniques of artifact analysis. Basic archaeological research techniques, methods of report writing. Prerequisite: ASM 101 or approval of instructor. May be repeated for credit for total of 8 hours.

366 Chronological and Ecological Techniques in Archaeology. (3) N

Procedures for dating archaeological remains and reconstructing ecological conditions of cultural pertinence at archaeological sites. Radiocarbon dating, dendrochronology, stratigraphy, pollen analysis, geomorphology, zooarchaeology. Prerequisite: ASB 330 or approval of instructor.

435 Archaeological Pollen Analysis. (3) F; Schoenwetter Theory, methodology, and practice of pollen analytic techniques. Compares uses in botany, geology, and archaeology. Field trips and laboratory. Prerequisite: approval of instructor. Two lectures, 3 hours laboratory.

452 Dental Anthropology. (4) F; Turner

Human and primate dental morphology, growth, evolution, and genetics. Within- and between-group variation. Dental pathology and behavioral-cultural-dietary factors. Prerequisite: approval of instructor. Three lectures, 3 hours laboratory.

455 Primate Behavior Laboratory. (3) N; Nash

Instruction and practice in methods of observation and analysis of primate behavior. Discussion of the relationship between class work on captive animals and field techniques for studying free-ranging groups. Prerequisites: ASM 343† and approval of instructor. Directed readings and 6 hours laboratory.

456 Laboratory Techniques in Anthropological Genetics. (3) N; Williams

A practical introduction to the various serological, immunological and electrophoretic techniques used by anthropologists to detect human genetic variation. Emphasis on learning the techniques in the laboratory and on theoretical questions of data analysis methods. Prerequisite: approval of instructor. One lecture, 6 hours laboratory.

465 Quantitative Methods. (3) N; Clark

Statistical techniques available as descriptive and analytical tools useful in processing and interpreting anthropological data. Presentation of the concepts underlying parametric statistics; nonparametric methods. Prerequisites: introductory statistics course and ASB 330, or approval of instructor.

466 Computer Archaeology. (3) F; Gaines

Methods of codifying and ordering nonmetric archaeological data. Structuring of file systems for storage/retrieval and manipulation using computer techniques. Student projects and a thorough review of the literature of computer application for the analysis of archaeological data. Prerequisite: approval of instructor.

471 Conservation: Museum Collections. (3) N; Ditter

Introduction to the documentation, analysis, cleaning, stabilization and restoration of museum collections; method, theory and practice. Prerequisite: approval of instructor.

472 Archaeological Ceramics. (3) N; Ditter

Analysis and identification of pottery wares, types and varieties. Systems for ceramic classification and cultural interpretation. Prerequisite: approval of instructor. Two lectures, 3 hours laboratory.

555 Advanced Human Osteology. (3) N; Merbs

Laboratory and field techniques in dealing with the human skeleton. Emphasis on preparation, identification, radiography, sectioning, microscopy and data processing. Prerequisite: ASM 341† or approval of instructor. One lecture, 6 hours laboratory.

591 Seminar. (3) N; Staff

Selected topics in archaeology and physical anthropology.

- (a) Physical Anthropology
- (b) Primates and Behavior
- (c) Advanced Computer Applications in Archaeology
- (d) Evolution and Culture (Same as ASB 591)
- (e) Interdepartmental Seminar (Same as ASB 591)

ANTHROPOLOGY (ASB)

Courses which may be applied toward the General Studies requirement in Social and Behavioral Sciences.

ASB 102 Introduction to Cultural and Social Anthropology. (3) F.S

Principles of cultural and social anthropology, with illustrative materials from a variety of cultures. The nature of culture. Social, political, and economic systems; religion, esthetics and language.

211 Women in Other Cultures. (3) N

Cross-cultural analysis of the economic, social, political and religious factors that affect women's status in traditional and modern societies.

231 Archaeological Field Methods. (4) S

Excavation of archaeological sites and recording and interpretation of data. Includes local field experience. Prerequisite: ASM 101 or approval of instructor. Two lectures, 8 hours laboratory.

311 Principles of Social Anthropology. (3) S

Comparative analysis of domestic groups and economic and political organizations in primitive and peasant societies.

312 Political Anthropology. (3) F

Comparative examination of the forms and processes of political organization and activity in primitive, peasant, and complex societies.

62 ANTHROPOLOGY

314 Comparative Religion. (3) F, S

Origins, elements, forms and symbolism of religion; a comparative survey of religious beliefs and ceremonies; the place of religion in the total culture. Prerequisite: ASB 102 or approval of instructor.

315 Primitive Arts and Technology. (3) F

Comparative survey of the material culture of peoples of the world emphasizing production and use of artifacts. Prerequisite: ASB 102 or approval of instructor.

320 Indians of Arizona. (3) F

The traditional cultures and the development and nature of contemporary political, economic and educational conditions among Arizona Indians.

321 Southwestern Ethnology. (3) S

Cultures of the contemporary Indians of the Southwestern United States and their historic antecedents. Prerequisite: ASB 102 or approval of instructor.

323 Peoples of Asia. (3) N

Races and cultures of Asia, including the more complex cultures of India, China, Japan and related areas. Prerequisite: ASB 102 or approval of instructor.

324 Peoples of Oceania. (3) N

Peoples and cultures of Oceania focusing particularly on societies of Melanesia, Micronesia and Polynesia. Prerequisite: ASB 102 or approval of instructor.

325 Peoples of Southeast Asia. (3) F

A cultural ecological perspective on the peoples of mainland and insular Southeast Asia. Subsistence modes, social organization, and the impact of modernization. Prerequisite: ASB 102 or approval of instructor.

330 Principles of Archaeology. (3) F

Prehistoric societies. Survey of dating methods, field techniques and artifact inventories. Geographic, climatic and geological relationships.

331 Old World Prehistory I. (3) F

Development of people as bio-social animals in the Pleistocene, emphasizing technological achievements and focusing upon the relationship between technology and environment. Areas include western Europe, sub-Saharan Africa and western Asia. Prerequisite: ASM 101 or approval of instructor.

332 Old World Prehistory II. (3) S

Post-Pleistocene focus on the transition from hunting/collecting societies to dependence upon domesticates. Factors leading to the establishment of settled village life and the development of the earliest urban centers. Prerequisite: ASM 101.

333 New World Prehistory. (3) S

The variety of archaeological patterns encountered in the Western Hemisphere. Covers the period from the appearance of humans in the New World to European contact; covers the area from Alaska to Tierra del Fuego.

334 Arctic Prehistory. (3) S

Past and present Aleut-Eskimo prehistory, origins, physical features, adaptations, variation and culture with comparisons of Asian Arctic populations. Prerequisite: ASB 101 or approval of instructor.

335 Southwestern Anthropology. (3) N

Past cultures in the Southwest and their relation to present peoples using archaeological, ethnological, and linguistic evidences. Environmental and resource utilization from earliest times to the present.

337 Archaeology of Mesoamerica. (3) S

Pre-conquest cultures and civilizations of Mexico. The Aztecs, Mayas and their predecessors. Prerequisite: ASM 101 or approval of instructor.

351 Culture and Personality. (3) S

Approaches to the interrelations between the personality system and the socio-cultural environment. Prerequisite: ASB 102 or approval of instructor.

355 American Indian Views of Man. (3) N

The main historical and geographical groupings of religious material from North America (including Mexico). Myths, ritual, and prose teachings, oral and written.

356 Aspects of Southwest Indian Religion. (3) N

Selected topics of general interest in which new interpretative work is taking place. Emphasis on comparison between tribes in respect to one or more topics such as mythology, calendrical rituals, curing, drama, etc.

364 Museum Techniques. (3) F

Laboratory techniques in restoration of artifacts. Museum display practices to present anthropological material. Prerequisite: ASM 101 or approval of instructor.

381 Introduction to Linguistics. (3) F

Descriptive and historical linguistics. Survey of theories of human language, emphasizing synchronic linguistics.

383 Linguistic Theory: Phonology. (3) F

Contemporary theories of the sound system of language. Laboratory. Prerequisite: ASB 381 or FLA 400 or approval of instructor.

411 Kinship and Social Organization. (3) S; Steadman, Martin

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: 6 hours of anthropology or approval of instructor.

412 History of Anthropology. (3) F; Eder, Bahr

Historical treatment of the development of the culture concept and its expression in the chief theoretical trends in anthropology between 1860 and 1950. Prerequisite: ASB 102 or approval of instructor.

415 Primitive Art. (3) S; Cain, Bahr

Art forms of primitive people in relationship to their cultural setting. Prerequisite: ASB 102 or approval of instructor.

416 Economic Anthropology. (3) F; Martin, Eder

Economic behavior and the economy in pre-industrial societies; description and classification of exchange systems; relations between production, exchange systems and other societal sub-systems. Prerequisite: ASB 102 or approval of instructor.

418 Indian Reservations Today. (3) N; Martin

Problems of reservation life; relationships between on- and off-reservation Indians.

421 The North American Indian. (3) F,S; Bahr, Martin

Archaeology, ethnology and linguistic relationship of the Indians of North America. Does not include Middle America. Prerequisite: ASB 102 or approval of instructor.

422 Archaeology of North America. (3) S; Schoenwetter

Origin, spread and development of the prehistoric Indians of North America up to the historic tribes. Does not include the Southwest. Prerequisite: ASM 101 or approval of instructor.

424 Indians of Mesoamerica. (3) S; Aguilar, Bahr
Historic tribes and folk cultures. Prerequisite: ASB 102 or approval of instructor.

426 Historical Archaeology. (3) NR; Ruppé
Principles, techniques, and important sites. Use of ethnohistory, laboratory techniques, and artifact analysis. Discussion of value to historical understanding. Prerequisite: one course in archaeology or approval of instructor.

430 Underwater Archaeology. (3) S; Ruppé
Survey of methods and techniques. Effects of changing sea levels on location and movement of human groups. Prerequisite: one course in archaeology or approval of instructor.

431 Ritual: The Creative Process. (3) N; Bahr
Ritual as an essential and creative religious act. Fundamental structures and typologies of ritual; techniques for interpretation and understanding ritual. Prerequisite: ASB 314†.

432 Mythology. (3) N; Bahr
How "myth" emerged as a concept in western civilization. "Mythic world view" as a supposed feature of primitive cultures. Methods for studying mythic and other texts collected from spoken traditions. Prerequisite: ASB 314†.

479 The Anthropology of Peasant Peoples. (3) N; Firestone, Aguilar
Description, comparison and theories pertaining to the social and community structure and world views of peasant peoples. Prerequisite: ASB 102.

481 Language and Culture. (3) S; Brandt
Application of linguistic theories and findings to nonlinguistic aspects of culture; language change; psycholinguistics. Prerequisite: ASB 102 or approval of instructor.

482 Linguistic Practice. (3) N; Brandt
Study of a non-Indo-European language with an informant. Prerequisite: ASB 381 or FLA 400 or approval of instructor.

483 Sociolinguistics and the Ethnography of Communication. (3) N; Brandt
Relationships between linguistic and social categories; functional analysis of language use, maintenance and diversity; interaction between verbal and nonverbal communication. Prerequisite: ASB 381 or approval of instructor.

510 Archaeology of Lowland Civilization in Mesoamerica. (3) F; Stark
Characteristics and adaptations of tropical lowland civilizations in Mesoamerica. Tropical lowland ecology and contrasts of socio-political and economic organization with highland Mesoamerican civilizations. Utilizes both archaeological and ethnohistorical data. Prerequisite: ASB 337† or approval of instructor.

532 Graduate Field Anthropology. (2-8) S; Staff
Independent research on a specific anthropological problem to be selected by the student in consultation with the staff. Prerequisites: ASM 338† or equivalent, and approval of instructor. May be repeated for credit.

533 Cultural Inventory Methods. (3) N; Dittert, Plog
Problems and procedures in locating and recording archaeological sites. Analysis of site types, situations, and relation to natural resources. Interpretation from surface remains. Field work. Prerequisite: approval of instructor.

534 Public Archaeology: Legislation. (3) F; Schoenwetter
Laws affecting archaeological research; policies and procedures used to administer laws; philosophical and practical problems of legal constraints on research; analysis of public documents generated through compliance with such laws. Prerequisites: regular graduate student

status, 12 completed graduate hours in archaeology, approval of instructor.

535 Public Archaeology: Implementation. (3) N; Dittert
Theoretical and practical applications of cultural resources legislation and policy. Conservation, development, and management of cultural resources. Prerequisite: ASB 534† or equivalent, or approval of instructor. Seminar and field work.

542, 543 Method and Theory of Archaeology. (3, 3) F, S; Staff
Development and theoretical basis of archaeology. Rationale and methods of reconstruction of past human behavior from archaeological data. Prerequisite: approval of instructor.

544 Settlement Patterns. (3) N; Dittert, Plog
Spatial arrangement of residences, distribution and density over the landscape, and utilization of a given environment for habitation. Prerequisite: approval of instructor.

546 Pleistocene Prehistory. (3) F; Clark
Development of society and culture in the Old World during the Pleistocene epoch, emphasizing technological change through time and the relationship of people to their environment. Prerequisite: ASB 331† or equivalent.

547 Rise of Urban Life. (3) S; Clark
Focus on the archaeological evidence in the Old World for the transition from subsistence economies dependent upon hunting and gathering to those dependent upon domesticated plants and/or animals. Impact of this shift in subsistence on local groups and on sedentism in both "nuclear" and "nonnuclear" areas. Prerequisite: ASB 332† or equivalent.

582 Linguistic Theory: Syntax. (3) N; Brandt
Contemporary theories of the grammatical structure of languages. Prerequisite: ASB 381 or FLA 400 or approval of instructor.

583 Linguistic Theory: Phonological Systems. (3) F; Brandt
Origins and development of contemporary phonological systems with particular attention to non-Western languages. Prerequisite: FLA 400 or ASB 381 or approval of instructor.

585 Linguistic Theory: Semantics. (3) N; Brandt
Contemporary theories on the semantic structure of languages with particular attention to non-Western languages. Prerequisite: ASB 381 or FLA 400 or approval of instructor.

591 Seminar. (3) N; Staff
Selected topics in archaeology, linguistics and social-cultural anthropology.

- (a) Cultural Anthropology
- (b) Social Anthropology
- (c) Problems in Southwestern Ethnology
- (d) Culture and Personality
- (e) Linguistics
- (f) Museology
- (g) Problems in Southwestern Archaeology
- (h) Archaeology

64 BIOLOGICAL SCIENCES; BOTANY AND MICROBIOLOGY

(i) Evolution and Culture (Same as ASM 591)

(j) Interdepartmental Seminar (Same as ASM 591)

Special Courses: ASM and ASB 484, 493, 498, 499, 500, 580, 584, 590, 592, 598, 599, 790, 792, and 799. (See pages 32-33.)

Biological Sciences

The following curricula are offered jointly by the Department of Botany and Microbiology and the Department of Zoology. Students who elect one of these programs are advised by a member of the Botany and Microbiology Department or by a member of the Zoology Department.

Bachelor of Science Degree Curriculum

Biology—A combined offering by the faculties of the Departments of Botany-Microbiology and Zoology. This major serves 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 BIO 101, 102†, 340†; MIC 201† or 210†, 202†. The additional 30 hours in the major must reflect a balanced distribution of courses in the two departments in the areas of physiology, ecology, morphology, and systematics. Supporting courses required are CHM 113†, 115†, 231† or 331†, 332†, 335†, 336†; PHY 101 or 111†, 112†, 113†, 114†; MAT 115† or 117†, and 118†; one year of an approved foreign language. (See Graduation Requirements, page 39.)

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 BIO 101, 102†, 320†, 340†; BOT 300† or 370†; MIC 201† or 210†, 202†; BOT 360†; ZOL 360†; ZOL 350† and one additional course selected from one of the following areas: Ecological area, BIO 426†, 427†; BOT 420†; ZOL 425†, 427†; ERA 333†. Systematic area, BOT 410†, 434†, 448†, 450†, 470†

or 475†; ENT 300†, 400†; MIC 470†; ZOL 270†, 453†, 472†, 473†, 474†, 475†. Morphological area, BIO 432†; BOT 350†, 445†; ZOL 330†, 432†, 433†, 450†. Physiological area, BOT 461†; MIC 420†, 460†, 485†; ZOL 460†, 468†, 469†. Genetic area, BIO 441†, 442†, 443†; ZOL 440†; MIC 441†, 442†; ZOL 241†. Developmental area, BIO 430†, 431†; ZOL 330†. Behavioral area, ZOL 280†, 481†. The total program must reflect a balanced distribution of courses from both departments. Supporting courses are: CHM 113†, 231†; elementary biochemistry is strongly recommended. BIO 480† is required in the professional education program.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Biological Sciences—Consists of 24 semester hours as follows: BIO 101, 102†, 340†; MIC 201† or 210†, 202† and 9 additional hours in courses listed under biology, botany, entomology, microbiology, and zoology with the exception of the following: BIO 100, 218†, 318†; BOT 100; ZOL 110, 300. Supporting course: BIO 480† is required in addition to the 24 semester hours of credit in the biological sciences.

Botany and Microbiology

PROFESSORS:

SOMMERFELD (LS C-206) ARONSON,
CANRIGHT, JOHNSON, NORTHEY, PATTEN,
PINKAVA, REEVES, SCHMIDT

ASSOCIATE PROFESSORS:

BIRGE, LEATHERS, NASH, SZAREK, TOWILL,
TRELEASE

ASSISTANT PROFESSORS:

BURKE, CLARK, 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 BIO 101, 102†, 320†, 340†; MIC 201† or 210†, 202†; BOT 350†, 360†, 370† and at least one of the following: BOT 410†, 434†, or 450†. Supplementary courses CHM 113†, 115†, 231†, or the sequence 331†, 332†, 335† and

336†; MAT 115† or 141†; and one year of an approved foreign language are also required. (See Graduation Requirements, page 39.)

Microbiology—A student majoring in microbiology is required to take the following courses: BIO 101, 102†, 340†; CHM 331†, 332†, 335†, 336†; MIC 202†, 210†, 302†; plus 16 hours of upper division electives in microbiology or approved related fields. Total: 41 semester hours. In addition, the student is required to have proficiency equivalent to one year of college French, German or Russian. The required supplemental courses are: CHM 113†, 115†, 121†; MAT 115† or 141†; PHY 111†, 112†, 113†, 114†. (See Graduation Requirements, page 39.)

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. Completion of the degree is dependent upon acceptance of the student by the hospital into an accredited internship program. The University does not guarantee that all students will be accepted into a hospital internship program.

Radiology—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 program. Completion of the degree is dependent upon acceptance of the student into an accredited internship program. The University does not guarantee that all students will be accepted into an internship 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

BiO 100 The Living World. (4) F, S, SS
Principles of biology. Not offered for credit to students who have had advanced biology in high school. Cannot be used for major credit in the biological sciences. Three lectures, 3 hours laboratory.

101, 102 Biological Principles and Processes. (4) F, S, SS
A comprehensive treatment of biological concepts emphasizing fundamental principles of biology and the interplay of structure and function at the molecular, cellular, organismal, and population levels of organization. For majors in biological sciences and preprofessional students in health

related sciences. Secondary school chemistry strongly recommended. (BIO 101 is a prerequisite for BIO 102). Three lectures, 3 hours laboratory.

217 Introduction to Fisheries and Wildlife Management. (3) F
Principles relating to management of cold and warm water fisheries and terrestrial wildlife, emphasizing management of ecosystems. Designed for prospective wildlife biologists. Prerequisites: 8 semester hours of biological sciences.

218 History of Medicine. (1) F
Development of medical concepts.

300 Natural History of Arizona. (3) F
Plant and animal communities of Arizona. Cannot be used for major credit in the biological sciences. Prerequisite: junior standing.

301 Field Natural History. (1) F, S
Organisms and their natural environment. Two weekend field trips and a field project. Prerequisite: BIO 300 or concurrent enrollment. Cannot be used for major credit in the biological sciences.

310 Special Problems and Techniques. (1-3) F, S
Qualified undergraduates may investigate a specific biological problem under the direction of a faculty member. Prerequisites: formal conference with the faculty member and approval of the problem by the faculty member and of the departmental chair. May be repeated for a total of 6 credits.

318 History of Biology. (2) NR
Development of biological concepts. Prerequisite: 12 semester hours of biological sciences.

320 Fundamentals of Ecology. (3) F, S
Basic concepts in ecology. Organization, functioning and development of ecological systems, energy flow, biogeochemical cycling, environmental relations, population dynamics. Prerequisites: BIO 102 or equivalent or approval of instructor.

330 Ecology and Conservation. (3) F
Ecological and biological concepts of conservation used to understand man-made ecological problems. Cannot be used for major credit in the biological sciences.

340 General Genetics. (4) F, S, SS
Science of heredity and variation. Prerequisite: BIO 101, 102†. Three hours lecture, 1 hour recitation.

415 Biometry. (4) F
Statistical methods applied to biological problems, including design of experiments, estimation, tests of significance, analysis of variance, regression, correlation, chi square and bioassay; the use of computers. This course will not satisfy laboratory requirements for the Liberal Arts General Studies program. Prerequisite: MAT 210 or equivalent. Three hours lecture, 3 hours laboratory.

424 Analysis of Ecosystems. (3) S
Emphasizes production, respiration and decomposition. Prerequisites: senior or graduate standing. BOT 420†, ZOL 425† or equivalent courses.

425 Laboratory Ecosystem Analysis. (1) S
Methods of analyzing energy flow and nutrient cycling. Prerequisites: BOT 424†, ZOL 425† or equivalent. 3 hours laboratory.

426 Limnology. (3) F
Dynamics of inland waters, stressing the interrelations of climatic, geological, topographical, physical and chemical factors with special reference to aquatic life. Prerequisites: CHM 113†, ZOL 350†.

66 BOTANY AND MICROBIOLOGY

427 Limnology Laboratory. (1) F

Prerequisites: BIO 426† or approval of instructor. Three hours laboratory.

428 Biogeography. (3) F

Environmental and historical processes determining distributional patterns of animals and plants, emphasizing terrestrial life. Prerequisite: BIO 102† or equivalent; junior standing.

429 Advanced Limnology. (3) S

Recent literature, developments, methods and limnological theory; field and laboratory application to some particular topic in limnology. Prerequisite: BIO 426†.

430 Concepts in Developmental Biology. (3) S

Current concepts and experimental methods involving differentiation and biosynthetic activities of cells and organisms with examples from micro-organisms, plants and animals. Prerequisite: BIO 102† or equivalent.

432 Biochemical Cytology. (3) S

Cellular functions and chemistry based on the macromolecular organization of cellular components emphasizing the use of analytical procedures such as cell fractionation, ultrastructural radioautography, and cytochemistry. Prerequisites: BOT 360† or ZOL 360† or equivalent; CHM 231† or 331† or equivalent.

441 Cytogenetics. (3) F

Chromosomal basis of inheritance. Prerequisite: BIO 340†.

442 Cytogenetics Laboratory. (2) F

Microscopic analysis of meiosis, mitosis and aberrant cell division. Prerequisites or concurrently: BIO 441†, and graduate status. Six hours laboratory.

443 Molecular Genetics. (3) F

Nature and function of the gene. Prerequisites: BIO 340† and a course in organic chemistry.

445 Organic Evolution. (3) F

Processes and adaptive change and speciation in populations. Prerequisite: BIO 340† or ZOL 241†.

464 Photobiology. (3) S

Principles underlying the effects of light on growth, development, and behavior of plants, animals, and micro-organisms. Prerequisites: 12 hours of courses in life sciences; CHM 231† or 331†.

480 Methods of Teaching Biology. (3) F, S

Methods of instruction, experimentation, organization and presentation of appropriate content in biology. Prerequisites: either SED 311† or concurrent enrollment in SED 311 and 20 hours in the biological sciences. Two lectures, 3 hours laboratory.

512 Transmission Electron Microscopy. (4) F, S

Theory, use, and methods of preparing biological materials for transmission electron microscopy. Prerequisites: approval of instructor. Materials fee. Two lectures, 6 hours laboratory.

515 Scanning Electron Microscopy. (2) N, SS

Theory and use of scanning electron microscope for biological materials. Intensive five-week mini course. Prerequisite: approval of instructor. Materials fee. Three hours lecture, 6 hours laboratory.

520 Biology of the Desert. (2) S

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.

526 Quantitative Ecology. (3) N

Sampling strategies, spatial pattern analysis, species diversity, classification and applications of multivariate techniques to ecology. Prerequisites: one course in ecol-

ogy; BIO 415† or equivalent. Two lectures, 3 hours laboratory.

Special Courses: BIO 484, 492, 493, 494, 497, 498, 499, 590, 591, 592, 598, 599. (See pages 32-33.)

BOTANY

BOT 100 Botany. (4) F, S, SS

Major principles and processes in plant biology, including a brief survey of the plant kingdom. Emphasis on morphology, evolution, diversity, physiology and economic significance of plants. For nonmajors in the biological sciences. Three lectures, 3 hours laboratory.

300 Survey of the Plant Kingdom. (4) F

Systematic and evolutionary survey of the plant kingdom emphasizing diversity of gross and cellular structure, reproduction, life cycles and habitat. Prerequisite: one of the following: BIO 100, 102, BOT 100, ZOL 110, or equivalent. Three hours lecture, 3 hours laboratory.

301 Economic Botany. (3) F

Plants and plant products used by man throughout the world including their cultivation, processing and uses in modern life. Fibers, medicinals, beverages, perfumes, foods. Prerequisite: BIO 100 or equivalent.

350 Plant Anatomy. (4) F

Development and mature structure of tissues of vascular plants; patterns and modifications of leaf, stem, root and flower. Prerequisite: BIO 102† or equivalent. Three lectures, 3 hours laboratory.

360 Plant Physiology. (4) F, S, SS

Plant growth and development, nutrition, water relations, reproduction, metabolism and photosynthesis. Prerequisites: BIO 102† or equivalent; CHM 231†. Three lectures, 3 hours laboratory.

370 The Flora of Arizona. (4) S

Principles of taxonomy, identification of Arizona plants. Prerequisites: BIO 101 and 102†, or equivalent, or approval of the instructor. Two lectures, 6 hours laboratory.

410 Lichenology. (3) F '81

Chemistry, ecology, physiology and taxonomy of lichens. Prerequisite: BIO 102† or equivalent. Two lectures, 3 hours laboratory.

420 Plant Ecology. (4) S

Plants in relation to environments. Prerequisite: BIO 320† or equivalent. Three lectures, 3 hours laboratory or field trip. One weekend field trip.

425 Plant Geography. (3) F '82

Plant communities of the world and their interpretation, emphasizing North American plant associations. Prerequisite: BIO 102† or equivalent or approval of instructor.

434 General Mycology. (4) F

Various groups of fungi, their morphology, identification procedures and economic significance. Prerequisites: BIO 102† or equivalent, and/or MIC 202†. Two lectures, 6 hours laboratory.

445 Morphology of the Vascular Plants. (4) S '83

Comparative form and evolutionary trends in the major groups of vascular plants. Prerequisites: BOT 300 or equivalent. Three lectures, 3 hours laboratory.

448 Palynology. (2) N

Importance of spores and pollen (both fossil and modern) to systematics, evolution, ecology and stratigraphy. Prerequisite: approval of instructor.

450 Phycology. (4) S

The algae, both fresh water and marine forms, emphasizing field collection and identification of local representatives. Morphological, ecological, and economic aspects of the algae. Prerequisite: BIO 102† or approval of instructor. Three lectures, 3 hours laboratory.

455 Experimental Phycology. (4) N

Techniques employed in the isolation, identification, purification and culturing of fresh water and marine algae, emphasizing their use as experimental systems. Prerequisite: approval of instructor. Two lectures, 6 hours laboratory.

461 Physiology of Lower Plants. (3) F '82

Cellular physiology and biochemistry of algae and fungi; responses of these organisms to chemical and physical stimuli and their process or morphogenesis. Prerequisites: BIO 102† or equivalent; CHM 231†.

470 Taxonomy of Southwestern Vascular Plants. (4) SS

Identification of the vascular plants of the Southwest and the principles underlying their classification. Not open to students who have had BOT 370. Three lectures, 6 hours laboratory. Two field trips. Summer only.

475 Angiosperm Taxonomy. (3) S '83

Principles underlying angiosperm phylogeny. Prerequisite: BOT 370† or approval of instructor. Two lectures, 3 hours laboratory.

490 Paleobotany. (4) S '82

A broad survey of plant life of the past, including the structure of plant fossils, their geologic ranges, geographic distribution and paleoenvironment. Prerequisite: BIO 102 or equivalent. Three lectures, 3 hours laboratory or field trip.

510 Experimental Design. (3) S '83

ANOVAS, one-way classification of factorial and partially hierarchic designs, introductory multivariate statistics. Prerequisite: BIO 415† or equivalent. One 3-hour lecture at night.

523 Biophysical Plant Ecology. (2) F '82

Theory of physical microenvironments and effects on plant growth. Consideration of plant energy exchange and soil-plant-atmosphere water relations. Optional corequisite: BOT 524†. Prerequisite: BOT 360† or approval of instructor. Two lectures.

524 Biophysical Plant Ecology Laboratory. (1) F '82

Methods of analysis of plant energy exchange and water relations of the soil-plant-atmosphere continuum. Operation and application techniques of methods utilized in analysis of the physical environment. Optional corequisite: BOT 523†. Prerequisite: approval of instructor. One 3-hour laboratory.

527 Physiological Plant Ecology. (2) F '81

Investigations of physiological adaptations of plants to environmental stresses; ecological significance for growth and survival. Environmental and biological control of photosynthesis and transpiration. Optional corequisite: BOT 528†. Prerequisite: BOT 360† or approval of instructor.

528 Physiological Plant Ecology Laboratory. (1) F '81

Methods of analysis of photosynthesis and transpiration. Infrared CO₂ analysis. CO₂-radioisotope analysis, and water vapor diffusion. Optional corequisite: BOT 527†. Prerequisite: approval of instructor. One 3-hour laboratory.

564 Plant Metabolism. (3) F '81

General plant metabolism and typical plant products, emphasizing biosynthesis and functions of storage prod-

ucts, cell wall constituents, plant acids, pigments, hormones and numerous secondary products. Prerequisites: CHM 231†; BOT 360†; or approval of instructor.

570 Plant Secondary Chemistry. (3) S '82

Biosynthesis and distribution of plant natural products within various plant taxa. Prerequisites: CHM 331†, 332† or equivalent. Three lectures.

571 Methods in Biochemical Systematics. (3) S '83

Techniques in isolation and characterization of major classes of natural products used in biochemical systematics. Prerequisite: approval of instructor. Two lectures, 3 hours laboratory.

576 Experimental Plant Systematics. (3) S '82

Interpretation of taxa, utilizing cytological, genetic, ecological, morphological and anatomical techniques and data. Prerequisite: BOT 370 or 470 or approval of instructor. Two lectures, 3 hours laboratory.

591 Seminar. (1-3) N

Topics may be selected from the following:

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

Special Courses: BOT 484, 492, 493, 494, 497, 498, 499, 500, 590, 592, 598, 599, 700, 790, 791, 792, 799. (See pages 32-33.)

MICROBIOLOGY

MIC 105 Medical Technology Orientation. (1) F,S

Introduction to the field of clinical laboratory technology. Includes lecture and laboratory experience. Required for medical technology majors.

201 Microbiology. (3) F,S,SS

Basic course for nonmajors emphasizing general principles of the role of micro-organisms in health, ecology, and related applied fields. Prerequisites: CHM 101 and any one of the following: BOT 100, BIO 100, ZOL 100, or approval of instructor.

202 Microbiology Laboratory. (1) F,S,SS

Principles and laboratory techniques used in identifying and handling micro-organisms. Prerequisite: credit or concurrent enrollment in MIC 201† or 210†. Three hours laboratory.

210 General Bacteriology. (3) F,S

Detailed study of the bacterial cell, its structure, genetics, physiology, and taxonomy. Intended for microbiology majors and others with similar preparation. *Not open to students with credit in MIC 201.* Prerequisites: BIO 102†; and CHM 115†.

302 General Bacteriology Laboratory. (2) F,S; staff

Advanced laboratory techniques in bacterial growth, physiology, genetics, microscopy, and basic virology. Required of microbiology majors. Prerequisites: either group A or B: (A) MIC 202† and 210†; (B) MIC 201† and 202† and approval of instructor. Four hours laboratory.

315 Medical Microbiology. (5) S

Laboratory techniques used in medical bacteriology, mycology and parasitology. Limited to commonly encountered human pathogens. Cannot be used for major credit in Zoology, Botany, or Microbiology. Prerequisite: MIC 202† and 201† or 210†. Three hours lecture, 6 hours laboratory.

360 Bacterial Physiology. (3) S

Mechanisms and control of cell metabolism, structures, and functions. Prerequisites: MIC 210; credit or concurrent enrollment in CHM 331, or approval of instructor.

370 Instrumentation. (4) F,S

Principles, structure, and application of clinical laboratory instruments, including electronics, spectrophotometric analysis, quality control, laboratory mathematics and automated analysis. Prerequisite: CHM 115† and PHY 101 or equivalents. Three lectures, 3 hours laboratory.

375 Concepts in Medical Technology. (5) S

Basic concepts and laboratory techniques in hematology, urinalysis and serology. Prerequisite: acceptance to an affiliated hospital internship program. Three hours lecture. 6-8 hours laboratory.

401 Medical Technology Laboratory Techniques and Theory. (16) F,S

Experience, including lecture and laboratory, in the areas of hematology, clinical chemistry, microbiology and immunohematology.

402 Medical Technology—Advanced Medical Laboratory Specialization. (16) F,S

Advanced lecture series and clinical laboratory experience including patient services. Specialization in one or more areas of clinical laboratory technology.

403 Specialized Medical Technology Laboratory. (12) F,S

Advanced techniques in all areas of the laboratory based upon individualized program development for students with MLT registration or eligibility.

420 Immunology. (4) F,S

Principles of immunity and their application to diagnosis, systematics and allergies. Prerequisites: MIC 202†; CHM 231† or equivalent. Two lectures, 6 hours laboratory.

425 Advanced Immunobiology. (3) S

Cells and tissues of immune system, their structure, function, and interaction. Prerequisites: MIC 420†. Two lectures, 3 hours laboratory.

434 Medical Mycology. (3) S

Fungi as causal agents of diseases of man, including pathology and epidemiology, emphasizing techniques of diagnosis. Prerequisite: MIC 202† or equivalent. Two lectures, 3 hours laboratory.

441 Bacterial Genetics. (3) S

Mutagenesis, molecular transfer mechanisms of hereditary material, and genetic recombination in bacteria and their viruses. Prerequisites: MIC 201† or 210† and BIO 340†, or approval of instructor.

442 Bacterial Genetics Laboratory. (1) S

Techniques of mutagenesis, mapping, and strain construction. Prerequisites: MIC 202† and credit or concurrent enrollment in MIC 441†. Four hours laboratory.

470 Systematic Bacteriology. (3) F

Classification and identification of bacteria. Prerequisites: MIC 202†, 5 hours of microbiology. One lecture, 6 hours laboratory.

481 Diagnostic Bacteriology. (3) F

Biochemical and immunological methods for characterizing pathogenic bacteria. Prerequisites: MIC 202†, CHM 231† or CHM 331†. Two lectures, 3 hours laboratory.

485 Virology. (3) F

Fundamental nature of viruses and other obligate intracellular parasites, their replication, pathogenesis, ecology and cultivation. Prerequisites: 8 hours of microbiology; CHM 331†. Two lectures, 3 hours laboratory.

520 Selected Topics in Immunology. (3) F

Current literature concerning immunology, particularly concerning recent advances in immunogenetics and regulation of immune response. Prerequisites: MIC 420†.

530 Bacterial Differentiation. (3) F

Molecular biology of sporulation and germination in bacteria. Emphasis on the control of cellular differentiation. Prerequisites: MIC 441 or BIO 443, or approval of instructor.

560 Bacterial Physiology. (3) F

Biochemical aspects of microbial growth and metabolism. Enzymes of terminal oxidation involved in synthesis and metabolism of cellular intermediates. Prerequisites: 5 hours of microbiology; CHM 331† or equivalent; or approval of instructor. Two lectures, 3 hours laboratory.

581 Selected Topics in Host-Bacterial Relationships. (3) S

Pathogenic mechanisms and host responses in bacterial diseases. Prerequisites: MIC 481† or approval of the instructor; MIC 420†.

591 Seminar. (1-3) N

Topics may be selected from the following:

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

Special Courses: MIC 298, 484, 492, 493, 494, 497, 498, 499, 500, 590, 592, 598, 599, 700, 790, 791, 792, 799. (See pages 32-33.)

Chemistry

PROFESSORS:

MUNK (PS D-102), BIEBER, BIRK, D. BROWN, P. BROWN, T. BROWN, BURGOYNE, BURKE, BUSECK, CRONIN, EYRING, FUCHS, HARRIS, HOLLOWAY, JUVET, LIN, LIU, LUCHSINGER, MOELLER, C. MOORE, NAVROTSKY, O'KEEFFE, PARSONS, PETTIT, THOMSON, WHITEHURST, YUEN, ZASLOW

ASSOCIATE PROFESSORS:

GLAUNSINGER, GUST, VON DREELE

ASSISTANT PROFESSORS:

LOHR, T. MOORE, ROSE, SANNER

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: CHM 117†, 118†, (or 113†, 115†); 225†, 226†, 317†, 318†, 319†, 320† (or 331†, 332†, 335†, 336†); and 341†, 343†, 453†. Related courses must include PHY 111†, 112†, 113†, 114†; and MAT 115†, 210†, or equivalent.

lent or more advanced courses. The remaining courses to complete the major will be determined by the student in consultation with his/her advisor. (See Graduation Requirements, page 39.)

Bachelor of Science Degree Curriculum

Chemistry—Consists of 42 semester hours of credit in chemistry. Required courses are: CHM 117†, 118†, 317†, 318†, 319†, 320†, 425†, 426†, 427†, 428†, 441†, 442†, 444† and 453†. In addition, PHY 115†, 116†, 117†, 118†; MAT 274†, 290†, 291 (or 270†, 271, 272); and one year of German (or Russian or French) is required. German is essential for students planning advanced study in certain fields, especially organic chemistry. An appropriate course in computer science is recommended. The remaining chemistry courses to complete the major will be determined by the student in consultation with his/her advisor. With the consent of the department chair, selected advanced courses from other related scientific disciplines may be accepted in lieu of elective chemistry courses to complete the major.

Transfer students will be interviewed and advised of possible preparatory work. They must contact the department to arrange for the interview in advance of registration. (See Graduation Requirements, page 39.)

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.

Chemistry Exchange Program. Selected students in either the B.A. or B.S. program have the opportunity to participate in a chemistry exchange program during their junior year with the University of Lille in France. In order to qualify for this program, the student must have a working knowledge of French, and for this purpose, two years of French or the equivalent is recommended.

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: CHM 113†, 115†, 225†, 226†; 331†, 332†, 335†, 336† (or 231†, 361†);

341† (or 441†, 442†); 480† (or PSE 480† or PHY 480†); PHY 111†, 112†, 113†, 114†; and MAT 115†, 210†. The remaining courses to complete the major will be determined by the student in consultation with his/her 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: CHM 113†, 115†, 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/her 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

CHM 101* Introductory Chemistry. (4) F, S
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 CHM 231. Three lectures, 1 quiz, 2 hours laboratory.

113* General Chemistry. (4) F, S, SS
Principles of chemistry. Adapted to the needs of students in the physical, biological and earth sciences. Prerequisite: Three semesters of high school algebra or MAT 106. One year of high school chemistry recommended. Three lectures, 1 quiz, 2 hours laboratory.

114* General Chemistry for Engineers. (4) F, S
One semester college chemistry with emphasis towards engineering. Prerequisites: Three semesters of high school algebra or MAT 106; one year of high school chemistry. Students without high school chemistry must enroll in the CHM 113†, 116† sequence instead of CHM 114. Three lectures, 1 quiz, 2 hours laboratory.

115* General Chemistry With Qualitative Analysis. (5) F, S, SS
Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals and metalloids, introduction to organic chemistry. Laboratory includes qualitative analysis. Prerequisite: CHM 113† or two years of high school chemistry. Three lectures, 2 quizzes, 4 hours laboratory.

70 CHEMISTRY

116* General Chemistry. (4) F, S

Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals and metalloids, introduction to organic chemistry. Prerequisite: CHM 113† or two years of high school chemistry. Three lectures, 1 quiz, 2 hours laboratory.

117*, 118* General Chemistry for Majors. (4, 5) F, S

Unified approach to 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, three years of high school mathematics, CHM 117 for CHM 118. Corequisite: MAT 290† (or 270†) for CHM 118†. CHM 117: Three lectures, 1 conference, 2 hours laboratory. CHM 118: Three lectures, 1 conference, 5 hours laboratory.

225* Analytical Chemistry. (3) F, S, SS

Principles and methods of chemical analysis. Primarily for students in agriculture, pre-medicine, pre-dentistry, and medical technology. Prerequisite: CHM 115† or 116†.

226* Analytical Chemistry Laboratory. (2) F, S, SS

Experiments in chemical analysis. Corequisite: CHM 225†. One conference, 5 hours laboratory.

231* Elementary Organic Chemistry. (4) F, S

Representative groups of organic compounds, emphasizing biological applications. Adapted to students in nursing, home economics, agriculture and physical education. Prerequisite: CHM 101 or 114†, or 115†, or 116†, or one year of high school chemistry with grades of A or B, or approval of instructor. Three lectures, 1 quiz, 2 hours laboratory.

261* Elementary Biochemistry. (3) F, S

Topic coverage similar to CHM 361 but at a level suitable for students with minimal backgrounds in organic chemistry and mathematics. Examples and illustrations drawn from agriculture, nutrition and medicine wherever possible. Prerequisite: CHM 231† and math equivalent to high school algebra. Students who have completed or are taking CHM 331 may not enroll.

301 Chemistry and Society. (3) S

A qualitative survey of chemistry and its impact on modern technology and the environment. May not be counted toward the chemistry major.

317*, 318* Organic Chemistry for Majors. (3, 3) F, S

Structures, reaction mechanisms and kinetics, and systematic syntheses of organic compounds. Prerequisite: CHM 118†. Corequisites: CHM 319† for CHM 317†, CHM 320† for CHM 318†.

319* Organic Chemistry Laboratory I for Majors. (1) F

Emphasis on mechanisms, kinetics, and products of organic reactions. Pre- or corequisite: CHM 317†. One conference, 3 hours laboratory.

320* Organic Chemistry Laboratory II for Majors. (2) S

Continuation of CHM 319. Pre- or corequisite: CHM 318†. One conference, 7 hours laboratory.

331*, 332* General Organic Chemistry. (3, 3) F, S, SS

Chemistry of organic compounds. Prerequisite: CHM 115† or 116† or 118†; CHM 331 for 332.

335*, 336* General Organic Chemistry Laboratory. (1, 1) F, S, SS

Organic chemical experiments in separation techniques, synthesis, analysis and identification, and relative reactivity. Corequisites: CHM 331† for CHM 335†, CHM 332† for CHM 336†. Prerequisite: CHM 335† for CHM 336†. Four hours laboratory.

341* Elementary Physical Chemistry. (3) F

Properties of solids, liquids, gases, solutions, equilibrium, colloidal state. For pre-medical, biology, agriculture, etc., students. Prerequisites: CHM 114† or 118† or 225†, and CHM 231† or 331†, and MAT 210†.

343* Physical Chemistry Laboratory. (1) F

Physical chemical experiments. Corequisite: CHM 341† or 441†. Three hours laboratory.

361* Principles of Biochemistry. (3) F, S, SS

Structures, properties, and functions of proteins, enzymes, nucleic acids, carbohydrates, and lipids; the utilization and synthesis of these materials by living systems, and the relationship of these processes to energy production and utilization. Prerequisite: CHM 231†, 318† or 332†.

367 Elementary Biochemistry Laboratory. (1) F, S, SS

Experiments include qualitative analysis of major biological constituents such as carbohydrates, lipids, nucleic acids and proteins, and measurement of enzyme activity. Pre- or corequisite: CHM 261†, 361† or approval of instructor. Three hours laboratory.

392 Introduction to Research Techniques. (1-3) F, S, SS

Instrumental methods and philosophy of research by actual participation in chemical research projects. Prerequisite: approval of advisor and research supervisor. May be repeated for a total of 6 credits.

401 Chemical Literature. (1) S

The special information tools available in libraries which permit the researcher to perform an efficient literature search. Topics will include *Chemical Abstracts*, *Science Citation Index*, *National Standard Reference Data Series*, patents, computer search services and others. Prerequisite: CHM 318† or 332† or approval of instructor.

421* Instrumental Analysis. (3) S

Principles of instrumental methods in chemical analysis. Electroanalytical and optical techniques. Prerequisites: CHM 225† and 226†. Corequisite: CHM 442†.

422* Instrumental Analysis Laboratory. (1) S

Experiments in chemical analysis by electroanalytical and optical techniques. Corequisite: CHM 421†. Three hours laboratory.

424 Separation Methods and Quantitative Organic Analysis. (3) F

Theory and practice of gas, liquid, ion-exchange, and gel permeation chromatography, countercurrent distribution, electrophoresis, and distillation; qualitative and quantitative interpretation of IR, mass and NMR spectroscopy; quantitative methods of organic analysis via functional groups. Prerequisites: CHM 318† or 332†, and 442†, or approval of instructor. Two lectures, 4 hours laboratory.

425 Chemical Analysis. (2) F

Principles of chemical equilibria, separations, and analyses, chemical instrumentation. Pre- or corequisites: CHM 341†, or 441†.

426* Chemical and Instrumental Analysis. (3) S

Instrumental techniques for chemical analysis; methods for the interpretation of analytical data. Prerequisite: CHM 425†.

427, 428* Chemical and Instrumental Analysis Laboratory. (2,2) F, S

Classical and instrumental techniques in chemical analysis with emphasis on accuracy and precision. Pre- or corequisites: CHM 425† for CHM 427†, CHM 426† for CHM 428†. One conference, 5 hours laboratory.

431 Qualitative Organic Analysis. (3) F

Systematic identification of organic compounds. Prerequisites: CHM 118† or 226†, and CHM 320† or 336†, or approval of instructor. One lecture, 6 hours laboratory.

438 Polymers. (2) S

Chemistry and properties of natural and synthetic polymers. Prerequisite: CHM 318 or 332.

441, 442 General Physical Chemistry. (3, 3) F, S

Gases, liquids, solids, solutions, equilibrium, phase rule, electrochemistry, thermodynamics, atomic structure, radioactivity and colloids. Prerequisites: PHY 112† or 116† or ECE 202†, MAT 274†.

444* General Physical Chemistry Laboratory. (2) S

Physical chemical experiments. Prerequisite: CHM 441†. One conference, 5 hours laboratory.

447* Radiochemistry. (2) F

Radioactivity, natural and artificial radioisotopes, nuclear reactions, isolation of isotopes, nuclear energetics, measurement of radioactivity, tracer techniques and other applications. Pre- or corequisite: CHM 441†.

448 Radiochemistry Laboratory. (2) F

Radiation measurements, tracer methods, quantitative identification of isotopes, and other procedures applicable to chemical, physical, engineering and biological problems. Corequisite: CHM 447†. One conference, 5 hours laboratory.

452 Inorganic Chemistry Laboratory. (2) S

Preparation and purification of typical inorganic substances emphasizing methods and techniques. Prerequisite: approval of instructor. One conference, 5 hours laboratory.

453 Inorganic Chemistry. (3) F, S

Principles and applications of inorganic chemistry. Prerequisites: CHM 341† or 441†.

461, 462 General Biochemistry. (3, 3) F, S

Fundamental chemistry and metabolism of major biological materials and their role in the biochemical processes of living organisms. Prerequisites: CHM 318† or 332†, and CHM 341† or 441† or approval of instructor.

467, 468 General Biochemistry Laboratory. (2, 2) F, S

The application of modern chemical and physical methods to biochemical problems; purification and characterization of biological macromolecules; quantitative measurement of enzyme activity and properties; evaluation of metabolic processes. Corequisites: CHM 461† with 467†, 462† with 468†. One conference, 5 hours laboratory.

471 Solid State Chemistry. (3) F

Crystal chemistry, thermodynamics and electrochemistry of solids, nonstoichiometric compounds, diffusion and solid state reactions, crystal growth and selected topics. Pre- or corequisite: CHM 441†, or approval of instructor.

480 Methods of Teaching Chemistry. (3) N

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.

481 Geochemistry. (3) F

Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere. Prerequisite: CHM 341† or 441† or GLG 321. (Same as GLG 481.)

482 Physical Geochemistry. (3) N

Applications of thermodynamic and kinetic principles to geochemical processes. Prerequisite: CHM 341† or 441† or GLG 321†. (Same as GLG 482.)

485 Meteorites and Cosmochemistry. (3) N

Chemistry and mineralogy of meteorites and their relationship to the origin of the earth, solar system and universe. Prerequisite: CHM 481† or 482†. (Same as GLG 485.)

501 Current Topics in Chemistry. (1) F, S

Prerequisite: approval of instructor. May be repeated for credit.

521 Computer Interfacing to Chemical Instrumentation. (3) N

Assembly and machine language programming of laboratory-size computers for data acquisition and on-line, real-time control of chemical instrumentation. Digital logic and timing considerations in hardware interfacing of computers. No prior knowledge of computers or electronics assumed. Sound knowledge of chemical instrumentation desirable. Two lectures, 4 hours laboratory.

523 Advanced Analytical Chemistry. (3) A

Theoretical principles of analytical chemistry. Prerequisites: CHM 225†, and 442†, or their equivalents.

525 Spectrochemical Methods of Analysis. (4) N

Theoretical and practical considerations involving the use of optical instruments for chemical analysis emphasizing emission and absorption spectroscopy. Prerequisite: CHM 442†. Three lectures, 3 hours laboratory.

526 X-Ray Methods of Analysis. (4) N

Theoretical and practical considerations involving the use of X-ray diffraction and spectroscopy for chemical and structural analyses. Prerequisite: CHM 442†. Three lectures, 3 hours laboratory.

527 Electrical Methods of Chemical Analysis. (4) N

Theoretical and practical considerations of polarography, potentiometric, amperometric, and conductometric titrations. Prerequisite: CHM 442†. Two lectures, 6 hours laboratory.

531 Theoretical Organic Chemistry. (3) F

Reaction mechanisms, structure elucidation, stereoisomerism, conformational analysis. Prerequisites: CHM 318† or 332†, and 442†.

532 Theoretical Organic Chemistry. (2) S

Prerequisite: CHM 531†.

536 Natural Products. (2) N

Organic chemistry of such natural products as alkaloids, steroids, terpenes, organic medicinals, and antibiotics. Prerequisites: CHM 532†, 537†, and approval of instructor. May be repeated for credit.

537 Organic Reactions. (3) S

Important synthetic reactions of organic chemistry emphasizing recently discovered reactions of preparative value. Prerequisite: CHM 531†.

541 Advanced Principles of Chemistry I. (3) F

Thermodynamics and kinetics as applied to various areas of chemistry. Prerequisite: CHM 442†.

72 COMPUTER SCIENCE; ECONOMICS

545 Advanced Principles of Chemistry II. (3) S

Basic quantum theory, chemical bonding and molecular structure. Prerequisite: CHM 442†.

546 Quantum Chemistry. (3) F

Principles of quantum mechanics applied quantitatively to problems of chemical interest. Prerequisite: approval of instructor.

548 Chemical Kinetics. (2) N

Kinetic theory and rate processes. Prerequisite: approval of instructor.

553 Inorganic Chemistry. (3) F

Principles of modern inorganic chemistry and their applications over the entire periodic system. Prerequisites: CHM 442†, and CHM 453†, or their equivalents.

554 Advanced Inorganic Chemistry. (3) S

Elaboration and extension of the more important topics of CHM 553. Prerequisite: CHM 553†.

556 Topics in Inorganic Chemistry. (3) N

Prerequisites: CHM 553† and approval of instructor. May be repeated for credit.

563 Biophysical Chemistry. (3) N

Physical chemistry of macromolecules, especially proteins, nucleic acids and polysaccharides. Thermodynamics, hydrodynamics, and spectroscopy of biopolymers and their relation to structure. Prerequisites: CHM 462† and 442†.

579 Topics in Solid State Chemistry. (2-4) N

Prerequisite: approval of instructor. May be repeated for credit.

581 Isotope Geochemistry. (3) N

Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Prerequisite: approval of instructor. (Same as GLG 581.)

582 Topics in Geochemistry and Cosmochemistry. (3) N

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. (Same as GLG 582.)

583 Phase Equilibria and Geochemical Systems. (3) N

Study of natural reactions at high temperatures and pressures: silicate, sulfide and oxide equilibria. Prerequisite: CHM 482†. (Same as GLG 583.)

Special Courses: CHM 298, 484, 492, 493, 498, 499, 590, 591, 592, 593, 598, 599, 790, 792, 799. (See pages 32-33.)

**In each of the following groups, credit is allowed for one course only:* CHM 101, 113, 114 or 117; CHM 114, 115, 116 or 118; CHM 225 or 425; CHM 226 or 427; CHM 231, 317 or 331; CHM 261 or 361; CHM 318 or 332; CHM 319 or 335; CHM 320 or 336; CHM 341 or 441; CHM 343 or 444; CHM 421 or 426; CHM 422 or 428; CHM 446 or 447.

Computer Science

A major in computer science is offered in the College of Liberal Arts or the College of Engineering and Applied Sciences.

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Computer Science—Consists of 42 semester hours in computer science and related areas, plus 16 hours in mathematics. Required courses in the major include CSC 100†, 101†, 200†, 210†, 320†, 340†, 410†, 420†, 430†, 450†, and MAT 466† (or 464†). Required related courses are MAT 270† and 271† (or 290† and 291†), 242† (or 342†), 243†, and 326†. The remaining nine hours are to be chosen from a list provided by the department, and approved by the advisor.

Faculty and course descriptions are listed on pages 228-232.

Economics

A major in economics is offered in the College of Liberal Arts or the College of Business Administration.

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Economics—Consists of 45 semester hours of credit, of which 30 must be in economics and 15 in closely related fields to be approved by the advisor in consultation with the student. ECN 201, 202, 401†, 402†; MAT 141 and 226 or QBA 221 are required. (See Graduation Requirements, page 39.)

Bachelor of Science Degree Curriculum

Economics—Consists of 45-55 semester hours of credit, of which 30 must be in economics and the remainder in closely related fields to be approved by the advisor in consultation with the student. ECN 201, 202, 401†, 402†, MAT 141 and 226 or QBA 221 are required. (See Graduation Requirements, page 39.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum (Secondary Education)

Economics—Consists of 45 semester hours of credit including a minimum of 30 in economics and one course in methods of teaching economics. Remainder will be in closely related fields as approved by the advisor in consultation with the student. ECN 100, 201, 202, 401†, 402†; MAT 141 and 226 or QBA 221 are required.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Economics—Consists of 18 semester hours of credit. ECN 100, 201, and 202 are required. Remainder to be approved by the advisor in consultation with the student.

Latin American Studies Emphasis. (See Interdisciplinary Studies, page 54.)—Consists of the Bachelor of Arts degree requirements in Economics. At least 30 upper division semester hours of the total program must be in Latin American content courses, including 15 hours in Economics and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required, and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a bachelor's degree with a major in Economics—Latin American Studies Emphasis.

Departmental Graduate Programs

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

Faculty and course descriptions are listed on page 183.

English

PROFESSORS:

FISHER (LL B-504), BRACK, D'ANGELO, DOEBLER, DONELSON, ERNO, EVANS, FERRELL, GERBER, M. HARRIS, KEHL, LEVY, LIGHTFOOT, NEBEKER, NEY, NILSEN, SALERNO, SHAFER

ASSOCIATE PROFESSORS:

BENDER, J. BRINK, BUCKINGHAM, DUBIE, ELLIS, J. GREEN, M. GREEN, GREENE, HABERMAN, HAKAC, HELMS, HERMAN, JANSSEN, JOHNSON, MORAN, MURRAY, OJALA, PETERSON, RANDALL, SHINN, SWANSON

ASSISTANT PROFESSORS:

BARODY, BOYER, D. BRINK, BROSE, COLBY, DE MARINIS, FALTZ, NELSON, SANDS, STRAUSS

INSTRUCTOR:

K. HARRIS

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

English—Consists of 45 semester hours of credit; 36 of these hours must be in English, 9 hours in a related field to be chosen in consultation with the student's departmental advisor. Required courses are ENG 200, 221 and 222, 421 or 422, 312 or 314 or 413 or 424, a course in English literature before 1660, a course in English literature between 1660 and 1900, 341 or 342 or a course in American Literature before 1900. *No course may be used to satisfy more than one requirement.* At least 18 hours must be in upper division courses. (See Graduation Requirements, page 39.)

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 ENG 211† or 212†, 221, 222, 312 or 314 or 413, 341 or 342, 421 or 422, 471, 480†, one literary type course, one period course, and 12 hours of 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)

(Recommended for Elementary Education)

English—Consists of 24 semester hours of credit. Required courses are ENG 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 (with emphases in literature and language, teaching of English as a second language, linguistics, and creative writing) and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

English Literature in Transition. An independent scholarly journal with an international circulation, *English Literature in Transition: 1880-1920* was founded in 1957 and has had its editorial office in the ASU English Department since 1971. The journal is associated with the Annotated Secondary Bibliography Series of book-length reference works being published under the direction of Professor H. E. Gerber, the editor of *ELT*. The journal also maintains an international bibliographical file on nearly 100 English authors writing between 1880 and 1920. The English Department regularly offers several courses in the period with which the journal and related research projects deal. Ordinarily, two graduate students and an undergraduate work-study student are chosen to assist the editor in the preparation of the journal from manuscript to final printing and with several major related research projects.

ENGLISH

ENG 101 First Year English. (3) F, S, SS

Composition; emphasis on paragraph structure, correctness in English fundamentals, exactness and concreteness of statement; dictionary and library practice; intensive and extensive reading. Compare ENG 111.

102 First Year English. (3) F, S, SS

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. Compare ENG 112. Prerequisite: ENG 101.

103 Introduction to Literature. (3) F, S, SS

Introduction to literature through literary types, selections taken mainly from modern writers.

104 Advanced First Year English. (3) F, S, SS

Composition, emphasizing refining writing skills; intensive reading; research papers; logic. Prerequisite: passing grade on the ENG 101 exemption examination.

111 English for Foreign Students. (3) F, S

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. Satisfies the graduation requirement of ENG 101.

112 English for Foreign Students. (3) F, S

Reading on a broader scope and more emphasis on composition. Satisfies the graduation requirement of ENG 102. Prerequisite: ENG 111.

200 Critical Reading and Writing. (3) F, S

Introduction to the terminology, methods, and ends of the study of literature; practice in interpretation and evaluation of various texts.

201 World Literature. (3) F, S

The classical and medieval periods. Selections from the great literature of the world in translation and lectures on the cultural background.

202 World Literature. (3) F, S

The Renaissance and modern periods. Selections from the great literature of the world in translation and lectures on the cultural background.

204 Literature of Today. (3) F, S

Poetry, short story, novel and drama. Not for English majors. Not open to freshmen.

211 Advanced Composition. (3) F, S

Further training in organization and expression of ideas. Primarily for non-English majors. Prerequisite: ENG 102†. Two lectures, conferences arranged.

212 English Prose Style. (3) F, S

Analysis and practice of writing in various classical and modern prose styles. Prerequisites: Grade of "B" in ENG 102†, English major or approval of advisor and instructor. Two lectures, conferences arranged.

213 Introduction to the Study of Language. (3) F, S, SS

Language as code, phonology, morphology, lexicon, and the processes of language acquisition and behavior.

221 Survey of English Literature. (3) F, S, SS

Content and form of earlier English literature, including individual and national characteristics of certain authors.

222 Survey of English Literature. (3) F, S, SS

Based upon the later English literature.

300 Literary Interpretation and Evaluation. (3) N

Practice in writing papers on literary subjects. Alternate approaches to literature and their basis in critical theory.

301 Writing for the Professions. (3) S

Advanced practice in writing and editing expository prose, primarily for preprofessional majors.

307 Utopian Literature. (3) F

Selected works from the present to the classical period, including *Walden Two*, *Walden*, *Utopia*, and *The Republic*. Primarily for non-majors.

311 Creative Writing. (3) F, S

Writing laboratory. Lectures and conferences dealing with the various forms of imaginative writing. Prerequisites: ENG 211† or 212†, and approval of instructor. Two lectures, conferences arranged.

- 312 Current English Usage.** (3) F, S, SS
Trends in the study of the English language in its social setting.
- 314 Modern Grammar.** (3) F, S
Conventional, structural and generative grammars.
- 321 Introduction to Shakespeare.** (3) F, S, SS
Shakespeare's major comedies, histories and tragedies. Not open to English majors.
- 341 American Literature.** (3) F,S,SS
From colonial times to the Civil War, including the growth of nationalism and the rise of the New England school.
- 342 American Literature.** (3) F,S,SS
From Whitman to the present. Influence of westward expansion, growth of regionalism, literature of social protest and post-World War II writing.
- 345 Selected Authors or Issues.** (3-4) N
Different topics may be offered. Film topics with lab may carry 4 credits. Repeat credit for different topics.
- 352 Short Story.** (3) F,S,SS
Development of the short story as a literary form; analysis of its technique from the work of representative authors.
- 355 History of the Drama.** (3) S
Development of European drama from the Greek to the Romantic Period.
- 356 Biblical Backgrounds of Literature.** (3) F,S,SS
Reading of the Old and New Testaments, emphasizing types, ideas and sources in literature.
- 357 Introduction to Folklore.** (3) F
Survey of the history, genres, and dynamics of folklore with emphasis on oral traditions.
- 358 Afro-American Literature.** (3) N
Thematic and cultural study of the literature dealing with the Afro-American in the U.S.
- 359 American Indian Literature.** (3) S
Selected oral traditions of American Indians and their influences on contemporary Native American literary works.
- 360 History and Art of the Film.** (4) F,S
Development of the film as an art form. Techniques which the film shares with the other arts, and those which are unique to it. This course may be taken by English majors for elective credit only. Three lectures, 4 hours laboratory.
- 400 History of Literary Criticism.** (3) S; Staff
Major critics and critical traditions in the western world.
- 405 Style and Stylistics.** (3) N; Murray
Linguistic, rhetorical, and literary approaches to the analysis of style in poetry, fiction, and other forms of written discourse.
- 409 Writing for Film.** (3) N; Staff
Fiction writing within a screenplay format. Lectures, conferences, film viewing exemplary screenplays, and visiting writers from the film community.
- 410 Intermediate Creative Writing.** (3) F,S; Staff
Lectures, writing assignments, discussion and criticism. Separate sections for fiction and poetry. Prerequisite; ENG 311 or approval of instructor.
- 411 Advanced Creative Writing.** (3) F,S; Staff
Workshop for experienced writers with emphasis on developing individual style. Separate sections for fiction and poetry. Prerequisite: ENG 410 or approval of instructor.
- 412 Professional Writing.** (3) N; Staff
Lectures and conferences concerning techniques of writing for publication. Prerequisite: ENG 311† or approval of instructor. Two lectures, conferences arranged.
- 413 History of the English Language.** (3) F,S; D. Brink, Moran
Development of the language from the earliest times to the modern period.
- 415 Medieval Literature.** (3) F; Moran, Peterson
Medieval English literature in translation, from Beowulf to Malory (exclusive of Chaucer), emphasizing cultural and intellectual backgrounds, and including some continental works.
- 418 Renaissance Literature.** (3) F '82, F '84; Evans, J. Brink
Poetry and prose, 1485-1603, exclusive of the drama. Continental background, humanism, More, Sidney, Spenser, and other representative writers.
- 419 Age of Transition: 1603-1616.** (3) S '83; Evans
Prose and poetry, exclusive of Milton and the drama. Metaphysical, Cavalier, and Neo-classical verse, Donne, Jonson, Bacon, and other representative writers.
- 420 Renaissance Drama.** (3) F; Doebler, Ellis, Renaissance Staff
Sixteenth and seventeenth century drama. Marlowe, Kyd, Jonson, and other representative writers, exclusive of Shakespeare.
- 421 Shakespeare I.** (3) F,S; Renaissance Staff
A selection of comedies, histories, and tragedies including *Midsummer Night's Dream*, *Henry IV*, *Hamlet*, and *Macbeth*.
- 422 Shakespeare II.** (3) F,S; Renaissance Staff
A selection of comedies, histories, and tragedies including *Twelfth Night*, *King Lear*, *The Tempest*, and *Othello*.
- 423 Milton.** (3) F,S; J. Brink, Evans
Selected prose and poetry, emphasizing *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*.
- 424 Chaucer.** (3) F,S; Moran, Peterson
Chaucer's language, poetry and intellectual background.
- 425 Romantic Poetry.** (3) F; Helms, Murray
Poetry of Wordsworth, Coleridge, Shelley, Keats, Byron.
- 426 Victorian Poetry.** (3) S; Saierno, Johnson
Poetry of the second half of the 19th century. Special study of Tennyson, Browning, Arnold.
- 427 Age of Johnson.** (3) S; Brack, M. Green
Chief writers, movements, and books during Johnson's career as a dominating literary figure, together with their most important relationships to predecessors and followers.
- 428 Age of Dryden, Swift, and Pope.** (3) F, Brack, M. Green
Chief writers and movements in the nondramatic literature of the Restoration and early 18th century.
- 430 Cultural Backgrounds, 1832-1880.** (3) N; Gerber, Johnson
Selected works by writers such as Lamb, Carlyle, Ruskin, Mill, William Morris, Pater, and Yeats.
- 435 19th Century American Poetry.** (3) S; Buckingham, Janssen
Themes and developments in American poetry to 1900.
- 439 Drama from Dryden to Sheridan.** (3) S; Brack, M. Green
English drama of the Restoration and 18th century, especially critical theories and social forces affecting the stage.

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1. Babbling stage - ra
 2. Babbling
 3. Holophrases
 4. Two-word
 5. Simple
 6. Complex
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- 440 American Literature to 1815.** (3) N; Buckingham
Thought and expression from the time of the first English-speaking colonies to 1815.
- 441 20th Century American Drama.** (3) N; Haberman, Shinn
American drama since World War I, especially experimental techniques.
- 442 20th Century British Poetry.** (3) F; Haberman, Lightfoot
Major British poets of the period: techniques, aims and significance.
- 443 20th Century American Poetry.** (3) F; J. Green, Kehl, Lightfoot
Major American poets of the period to 1945: techniques, aims and significance.
- 444 American Romanticism, 1830-60.** (3) F; Fisher, Janssen, Levy
Art and ideas of major American transcendentalists and romantics.
- 445 American Realism, 1860-1900.** (3) S; Ferrell, Levy
Writers and influences that shaped the development of literary realism.
- 446 The American Novel from Dreiser to 1945.** (3) F; Ferrell, Kehl, Levy
Major American novelists of the period: developments in theory and practice.
- 448 20th Century British Novel.** (3) S; Haberman, Lightfoot
Twentieth century British novel since 1914.
- 451 The Novel to Jane Austen.** (3) F; Brack
From origins of prose fiction through the 18th century.
- 452 The 19th Century Novel.** (3) S; Gerber, Johnson
From Scott to Conrad.
- 453 The American Novel to Dreiser.** (3) F; Ferrell, Janssen, Levy
Sentimental, romantic, realistic and naturalistic novels in America.
- 455 The Form of Verse: Theory and Practice.** (3) N; Staff
Types, history, criticism and schools of theory of metrical form. Analysis of lyric, narrative and dramatic poetry. Original verse writing optional. Prerequisite: three hours of literature. Two lectures, conferences arranged.
- 456 Classical Backgrounds of English Literature.** (3) F; J. Brink, Ellis
Myths and legends of Greece and Rome and some of the works in which they appear.
- 457 American Poetry Since 1945.** (3) S; J. Green, Kehl, Lightfoot
Major American poets of the period: developments in theory and practice.
- 458 American Novel Since 1945.** (3) S; J. Green, Kehl
Major novelists of the period: developments in theory and practice.
- 460 Western American Literature.** (3) F,S; Hakac
Critical examination of ideas and traditions of the literature of the western United States, including the novel.
- 461 Women and Literature.** (3) N; Staff
Selected topics in British, American and world literature by or about women. May be repeated for credit when topics vary.
- 463 European Drama from Ibsen to 1914.** (3) N; Haberman
Chief continental and British dramatists of the period: the beginnings and development of realism.
- 464 European Drama from 1914 to the Present.** (3) N; Haberman, Lightfoot
Chief continental and British dramatists of the period, emphasizing experimental techniques.
- 471 Literature for Junior and Senior High School Students.** (3) F,S, SS; Staff
Prose and poetry which meet the interests, desires, and capabilities of high school students. Recent literature stressed.
- 480 Methods of Teaching English.** (3) F,S, SS; Staff
Methods of instruction, organization and presentation of appropriate content in English. Prerequisite: ENG 312 or 314 or 413.
- 485 Teaching of English as a Second Language.** (3) F; Ney
Nature of language learning, testing, analysis of differences between two languages as a basis of instruction. Problems of cultural orientation. Prerequisite: Teaching experience or approval of the instructor.
- 500 Research Methods.** (3) S; Staff
Methodology and resource materials for research. Analysis of criticism and scholarship, including evaluation of sources. Special sections for literature and for linguistics.
- 501 Introduction to Comparative Literature.** (3) N; Randall
Problems, methods, and principles, illustrated by selected critical essays and literary texts.
- 505 American English.** (3) S; Ney
Development of the English language in America including a survey of geographical and social dialects.
- 507 Old English.** (3) F; Moran, Peterson
Elements of Old English grammar, with selected readings.
- 508 Beowulf.** (3) S; Moran, Peterson
Intensive literary and linguistic study of Beowulf. Prerequisite: FNG 507.
- 509 Middle English.** (3) S '82; Moran, Peterson
A study of the language, including the principal dialects with selected readings.
- 510 The Structure of English.** (3) F; D. Brink, Ney
Grammatical patterns of English, particularly current linguistic approaches.
- 511 English Phonetics and Phonology.** (3) S; D. Brink
Current trends in phonological theory and its basis in acoustic and articulatory phonetics.
- 512 The Teaching of Composition.** (3) N; Staff
Current approaches to the teaching of composition and to the development of new school programs. Prerequisite: Teaching experience or approval of instructor.
- 513 Semantic Theory.** (3) F; Nilsen
Various semantic models and semantic pathologies with particular attention to English.
- 514 Advanced Grammar.** (3) S; Staff
Traditional, structural, and generative English grammars.
- 515 Middle English Literature.** (3) F '81, F, '83; Moran, Peterson
English literature from the 12th through the 15th century, exclusive of Chaucer.

520 Renaissance Literature. (3) S; Doebler, Evans
Poetry and prose of the English Renaissance, excluding drama.

525 American Literary Criticism. (3) N; Levy
Analysis and discussion of leading historical and critical interpretations of American literature from the beginnings to the present.

530 Classical Rhetoric and Written Composition. (3) F; D'Angelo, Composition Staff
Relationship of major texts in classical rhetoric to developments in composition theory, and literary theory and practice through the nineteenth century.

531 Rhetorical Theory and Literary Criticism. (3) S; D'Angelo, Composition Staff
Intensive study of major rhetorical theorists of the 20th century in such areas as literary criticism, discourse theory, and composition theory.

532 Composition Theory. (3) N; D'Angelo, Composition Staff
Intensive study in the rhetorical categories of invention, arrangement, style, aims, modes, and forms of written discourse.

545, 547, 548, 549: (3) N
Selected authors or issues. May be repeated for credit.

545 Studies in English Literature. (3) N; Staff

547 Studies in American Literature. (3) N; Staff

548 Studies in English Language. (3) N; Staff

549 Studies in Comparative Literature. (3) N; Staff

550 Contemporary Comparative Literature. (3) F; Randall
Current trends in American and other literature emphasizing their significance in contemporary thought.

591 Seminar. (3) F, S; Staff
Selected topics regularly offered in the various areas of English studies.

Special Courses: ENG 294, 298, 484, 492, 493, 494, 497, 498, 499, 580, 584, 590, 592, 593, 594, 598, 599, 790, 791, 792, 799. (See pages 32-33.)



Foreign Languages

PROFESSORS:

FLYS (LL B-404), BININGER, CARLSON,
COUCH, EKMANIS, FOSTER, GROBE,
HORWATH, MARTINEZ, SHEPPARD, VIRGILLO

ASSOCIATE PROFESSORS:

AHERN, ALARCON, CARVER, CROFT,
CURRAN, FRIEDMAN, HENDRICKSON,
KNOWLTON, LOSSE, LUENOW, RADKE,
SENNER, VOLEK, WOLLAM, WONG

ASSISTANT PROFESSORS:

ACEVEDO, ALEXANDER, BALDINI, BARKIN,
BURTON, GRUZINSKA, GUNTERMANN, LAETZ,
LAFFORD, REIMAN, RODD, SIMMONS, TIPTON,
VALDIVIESO, VASQUEZ, WIXTED

INSTRUCTORS:

HABERMAN, MORGAN, SCHUBACK, TU,
WILSON

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Asian Languages (Chinese/Japanese), French, German, Russian, Spanish—Consists of 45 semester hours of credit, of which 30 must be in one language and 15 in a second language or in closely related fields to be approved by the advisor in consultation with the student. Of the 30 hours required for the major, a minimum of 24 hours must be taken above the 200 level and must include at least 9 hours at the 400 level or above. Specific required courses for each major area are listed in a brochure available in the department. (See Graduation Requirements, page 39.)

Asian Studies Emphasis—Consists of the Bachelor of Arts degree requirements in Asian languages. In addition to the required 45 semester hours, 15 hours of Asian content courses selected with the approval of the student's advisor must be completed. Fulfillment of these requirements will be recognized on the transcript as a major in Asian Languages (Chinese/Japanese)—Asian Studies emphasis. (For an Asian Studies emphasis in other disciplines, see Asian Studies, page 52.)

Latin American Studies Emphasis (See Interdisciplinary Studies, page 54.)—Consists of the Bachelor of Arts degree requirements in Spanish. At least 30 upper division semester hours of the total program must be in Latin American content courses including 15 hours in Spanish and 15 in other disciplines. A read-

ing knowledge of Spanish or Portuguese is required, and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a bachelor's degree with a major in Spanish Latin American Studies emphasis.

Mexican American Studies Emphasis

Consists of 45 semester hours of credit, of which 30 hours must be in Spanish (to include SPA 421, 464, and 471) and 15 hours in Mexican American content courses as related fields. Fulfillment of requirements is recognized on the transcript as a major in Spanish Mexican American Studies emphasis.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Asian Languages (Chinese Japanese, French, German, Russian, Spanish) Consists of 45 semester hours of credit, of which 30 must be in one language and 15 in a second language or in closely related fields to be approved by the advisor in consultation with the student. Of the 30 hours required for the major, a minimum of 24 hours must be taken above the 200 level and must include at least 9 hours at the 400 level or above. Specific required courses for each major area are listed in a brochure available in the department.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Consists of a minimum of 24 semester hours of credit in one foreign language of which at least 18 hours must be taken above the 200 level (see departmental brochure for listing of required courses in each minor area)

Departmental Graduate Programs

The Department of Foreign Languages offers programs leading to the degrees of Master of Arts in French, German, and Spanish and the Doctor of Philosophy degree in Spanish. Consult the *Graduate Catalog* for requirements.

Foreign Language Requirement and Placement

For the degree of Bachelor of Arts, the College of Liberal Arts requires knowledge of one foreign language equivalent to the completion of two years' study at the college level. This

normally includes a sequence of courses numbered 101, 102, 201, and 202. For important exceptions in French, Greek, and Portuguese, see statement at head of respective course descriptions. Courses taken to satisfy the foreign language requirement for the B.A. degree will not count toward the General Studies requirements.

Students who have completed their secondary education in a school where a foreign language was the official language of instruction will be considered as having satisfied the foreign language requirement (See page 49.)

Languages not taught at Arizona State University will be accepted only as transfer credit, or upon successful passing of a proficiency examination, from an approved university.

Ordinarily, no placement or proficiency examination is administered to students who wish to continue studying a foreign language for which high school credits have already been received. Students should be guided by the following principles of equivalency.

- (1) One unit (one academic year) of high school-level study will be considered to equal one semester of study of the same language at the university level. Thus, students with one year of high school study would enroll in the second semester course (102); with two years of high school study, in the third semester course (201), etc.
- (2) Students who feel that their high school language preparation was inadequate may choose to place themselves on a lower level, but not lower than 111 with two or three years of high school study and 201 with four years of high school study.

Students will not receive university credit for foreign language studies undertaken in violation of these equivalency principles.

Students with prior knowledge of a language may have all or part of their requirement waived in any one of the following ways: (1) by satisfactory results in a departmental proficiency examination; (2) by achieving a grade of at least C in the last course of the required sequence (e.g., GER 102 or 111 for the B.S. in Chemistry, 202 for the B.A.); or (3) by achieving a grade of at least C in a course at the next higher level (e.g., any 300 level course for the B.A.).

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If college transfers are uncertain about course equivalencies, they should contact the Department of Foreign Languages.

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 regular class periods.

FOREIGN LANGUAGES

FLA 150 Introduction to East Asian Culture. (3) S
An introduction to the cultures of China, Japan, and Korea. Also listed as HUP 150.

323 Survey of Soviet Literature in Translation. (3) F,S
Knowledge of Russian is *not* required. Survey of the main literary movements, prominent authors, and the most significant works of prose, poetry and drama of the Soviet period (1917 to present).

400 Linguistics. (3) S, Staff
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.

415 Bilingualism and Languages in Contact. (3) F, Barkin

Analysis of linguistic aspects of bilingualism, e.g., pidgins and creoles, code-switching, and other contact phenomena; simultaneous/sequential bilingual language acquisition. Prerequisite: FLA 400 or equivalent, or approval of instructor.

420 Foreign Literature in Translation. (3) F,S
For non-language majors (except in Asian languages and Russian); open to language majors as a related-area course. Graduate students by permission. No prerequisite.

- | | |
|--------------|---------------------|
| a) Brazilian | g) Latin |
| b) Chinese | h) Portuguese |
| c) German | i) Russian |
| d) Greek | j) Soviet |
| e) Italian | k) Spanish |
| f) Japanese | l) Spanish-American |

480 Methods of Teaching Foreign Languages. (3) F,S
Teaching foreign languages and literatures at secondary and college levels. This course will not meet the Liberal Arts General Studies requirement for Humanities and Fine Arts. Required for admission to SED 433. Prerequisite: 12 hours of upper division courses in one foreign language.

485 Problems of Literary Translation. (3)
Theory and practice with emphasis on application through individual translation projects. May be repeated for a total of six (6) hours credit. Prerequisite: approval of the instructor in the respective language area.

515 Second Language Acquisition. (3) S; Barkin
Description and analysis of bilingual language acquisition and learning simultaneously or sequentially in natural and artificial settings. Prerequisite: FLA 400 or equivalent, or approval of instructor.

530 Romance Linguistics. (3) N, Staff
Discussion and selected readings in comparative and historical linguistic problems in the development from Latin to the earliest stages of the major Romance Languages. Prerequisite: one semester of college Latin desirable.

Special Courses: FLA 294, 494, 497, 498, 499, 591. (See pages 32-33.)

CHINESE

CHI 101, 102 Elementary Chinese. (5,5) F,S,SS
Pronunciation, grammar, elementary conversation, development of basic reading and writing skills. Standard dialect. Five lectures, 1 hour laboratory.

201, 202 Intermediate Chinese. (5,5) F,S
Systematic review of grammar. Development of vocabulary through reading, writing. Drill in aural/oral skills. Prerequisite: CHI 102† or equivalent. Five lectures, 1 hour laboratory.

205 Chinese Calligraphy. (1) F, S
An introduction to styles and techniques of Chinese writing. Knowledge of Chinese or Japanese is not required.

309, 310, 311, 312 Chinese Conversation. (2, 2, 2, 2) F, S
Intensive aural/oral drills towards conversational fluency in modern Chinese. To be offered in rotation, with each course covering different situations and vocabulary. Prerequisite: CHI 202†.

313, 314 Advanced Chinese. (3,3) F, S
The modern language in general, or specific areas depending on the student's needs or interests. Prerequisite: CHI 202† or equivalent. Three lectures plus arranged laboratory.

321, 322 Chinese Literature. (3, 3) F, S
Selected representative works of the various genres and periods. Prerequisite: CHI 202† or approval of instructor.

413, 414 Introduction to Classical Chinese. (3, 3) F, S
Reading in various genres of pre-20th century wen-yen, with analysis of its structural characteristics. Prerequisite: CHI 202† or the equivalent.

Special Courses: CHI 294, 492, 493, 494, 499, 590. (See pages 32-33.)

FRENCH

Any two of the 200-level courses may be taken in any order or simultaneously to satisfy the Liberal Arts language requirements.

FRE 101, 102 Elementary French. (4-4) F, S, SS
Intensive aural/oral drill in class and laboratory; basic grammar supplemented by simple prose readings. Not open to students with credit in FRE 111. Four lectures, 1 hour laboratory.

111 Fundamentals of French. (4) F, S
Primarily for students with two years of high school French who need review to enter second year study. Not open to students with credit in FRE 102. Four lectures, 1 hour laboratory.

201 Intermediate Grammar Review. (4) F, S, SS
A thorough review of French grammar, including full attention to literary usage. Prerequisite: FRE 102†, 111 or equivalent. Four lectures, 1 hour laboratory.

202 Intermediate Reading. (4) F, S
Extensive reading in 19th and 20th century literary and cultural texts. Designed to increase the student's vocabulary and to teach prompt recognition of stylistic usages and grammatical structures. Prerequisite: FRE 102†, 111 or equivalent. Four lectures, 1 hour laboratory.

203 French Conversation. (4) F, S, SS
Current usage in expression of ideas. Especially recommended for students who plan to travel in French-speaking countries or who desire supplementary practice in speaking and understanding before advancing to 300-level courses. Prerequisite: FRE 102†, 111 or equivalent. One hour laboratory required.

311 French Conversation. (3) F, S

Further practice in speaking French, emphasizing current usage and promoting facility in the expression of ideas. One hour laboratory work required. Prerequisites: FRE 203†, and 201† or 202†, or equivalents.

312 French Composition. (3) F, S

Further practice in writing French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisite: eight hours of 200-level French, including 202† or equivalents.

319 Business Correspondence and Communication. (3) S

Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: FRE 312† or approval of instructor.

321, 322 French Literature. (3-3) F, S

Representative masterpieces and significant movements of French literature. Prerequisite: FRE 202†, plus either FRE 203† or FRE 311†, or equivalents.

410 French Phonetics and Diction. (2) F '82

Theory and practical application. Prerequisites: FRE 311†, 312†, or equivalents.

411 Advanced Spoken French. (3) F

Improvement of spoken French. Prerequisites: nine hours of 300-level French, including FRE 311†, or equivalents.

412 Advanced Written French. (3) S

Improvement of composition skills. Prerequisites: nine hours of 300-level French, including FRE 312† or equivalents.

415 French Civilization. (3) S '83; Wollam

Political, intellectual, social, economic and artistic development of the French nation from its origins to the present. Prerequisite: six hours of upper division French.

431 French Women in Society and the Arts. (3) N; Staff

Outstanding French women who have contributed to the shaping of society and the arts from the Middle Ages to present. Prerequisite: nine hours of 300-level French, including FRE 321†, 322†, or approval of instructor.

441 French Literature of the 17th Century. (3) F '82; Grobe

From 1600 to 1660. Prerequisite: nine hours of 300-level French including FRE 321†, or approval of instructor.

442 French Literature of the 17th Century. (3) S '83; Grobe

From 1660 to 1700. Prerequisite: nine hours of 300-level French, including FRE 321†, or approval of instructor.

445 French Literature of the 18th Century. (3) F '82; Wollam

Contributions of the philosophers, development of the novel and drama. Prerequisite: nine hours of 300-level French, including FRE 321†, or approval of instructor.

451 French Poetry of the 19th Century. (3) S '83; Gruzinska

From Romanticism to Parnassian poetry to Symbolism. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

452 French Novel of the 19th Century. (3) S '82; Gruzinska

From Constant, Hugo, Balzac, Stendhal, and Sand to Flaubert and Zola, with emphasis on major literary movements. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

453 Theater of the 19th Century. (3) N; Gruzinska

From Romantic drama to the Symbolist Theater. Representative plays of Hugo, Musset, Vigny, Dumas, Becque, Rostand, Feydeau and Mirbeau. Prerequisite: nine hours

of 300-level French, including FRE 322†, or approval of instructor.

461 Pre-Atomic Literature. (3) F '81; Wollam

Representative authors from Proust, Malraux to Sartre, from 1900 to 1945. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

462 Post-Atomic Literature. (3) S '82; Radke

Representative authors including Camus, Duras and Robbe-Grillet, from 1945 to present. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

471 The Literature of Francophone Africa and the Caribbean. (3) S '82; Losse

Selected prose, poetry and drama of black authors from Africa and the Caribbean. Prerequisite: nine hours of 300-level French including FRE 322†, or approval of instructor.

500 Bibliography and Research Methods. (3) F; Hendrickson

Required of all graduate students.

510 Explication de Textes. (3) N; Radke

Detailed analysis of literary texts.

511 French Stylistics. (3) N; Staff

Art of writing literary French, comparative stylistics.

515, 516 Intellectual Currents in France, from the Middle Ages Through the 20th Century. (3-3) N; Grobe

Significant social, esthetic, philosophic, and scientific ideas as presented by major writers of fiction and nonfiction.

521 History of the French Language. (3) N; Hendrickson

Principal phonological, morphological and semantic developments of French from its Latin origins to the present. Prerequisite: some familiarity with Latin recommended.

531 Medieval French Literature. (3) S '83; Hendrickson

Readings in the epics, early drama, roman courtois and other representative literary genres of the Middle Ages.

535 French Literature of the 16th Century. (3) F '81; Losse

Readings in French Renaissance literature with special attention to the humanist movement and to Rabelais, Montaigne and the Pleiade.

591 Seminar. (3) N; Staff

Topics may be selected from the following:

- (a) French Literary Criticism
- (b) Corneille, Molière 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

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- (j) Flaubert
- (k) Stendhal and Zola

Special Courses: FRE 492, 493, 494, 498, 499, 590, 592, 598, 599. (See pages 32-33.)

GERMAN

GER 101, 102 Elementary German. (4-4) F, S, SS
Reading, writing, speaking and understanding of basic German with emphasis on pronunciation and grammar. Not open to students with credit in GER 111. Four lectures, 1 hour laboratory.

111 Fundamentals of German. (4) F, S
Primarily for students with two years of high school German who need review to enter second year study. Not open to students with credit in GER 102. Four lectures, 1 hour laboratory.

201, 202 Intermediate German. (4-4) F, S, SS
Intensive review of grammar with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. Prerequisite: GER 102† or 111 or equivalent. Four lectures, 1 hour laboratory.

303, 304 Scientific German. (3-3) F, S
Acquisition of a specialized vocabulary through the reading of German scientific publications. Prerequisite: GER 102† or 111.

311, 312 German Conversation. (3-3) F, S
Expansion of idiom through oral practice dealing with contemporary articles, essays, and stories. (Three hour credit limit for majors). Prerequisite: GER 202† or equivalent.

313 German Composition. (3) S
Intensive practice in writing, emphasizing style and grammar. Prerequisite: GER 202† or equivalent.

314 Introduction to German Literature. (3) F
Beginning study of German poetry, drama, the novel and the *Novelle*. Prerequisite: GER 202† or equivalent.

319 Business Correspondence and Communication. (3) S
Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: GER 313† or approval of instructor.

321, 322 German Literature. (3-3) F, S
From the beginning to Classicism and from *Romanticism* to the present. Prerequisite: GER 202† or approval of instructor.

411 Advanced Grammar and Conversation. (3) F
Improvement of diction and idiom through intensive oral review. Prerequisite: GER 311† or 312† or equivalent.

412 Advanced Grammar and Composition. (3) S
Improvement of writing ability. Prerequisite: GER 313† or equivalent.

415 German Civilization. (3) A '83; Horwath
Aspects of political, social and cultural life of the German-speaking world. Prerequisite: any 300-level course in German or approval of instructor.

445 German Literature: Enlightenment to Classicism. (3) S '82, F '83; Senner
Major works of the literary epochs in the 18th century. Prerequisite: GER 321† or approval of instructor.

451 German Literature: Biedermeier to Naturalism. (3) S, F '81; Horwath
Representative works of prose and poetry from 1820 to 1890. Prerequisite: GER 322† or approval of instructor.

461 Contemporary German Literature. (3) N; Horwath
German writers since 1945. Prerequisite: GER 322† or approval of instructor.

500 Bibliography and Research Methods. (3) F '82; Senner
Required of all graduate students.

511 German Stylistics. (3) S '83; Carlson
Art of writing literary German, comparative stylistics.

521 History of German Language. (3) S '82; Laetz
Linguistic development of German from the earliest records to the present.

523 German Drama. (3) F '81; Alexander
Drama of the 19th and 20th centuries.

525 German Novel. (3) F '82; Alexander
Special studies in the German novel.

527 The *Novelle*. (3) N; Carlson, Senner
Special studies in the German short story.

531 Middle High German Language and Literature. (3) S '83; Laetz
Reading and discussion of specimens of the Middle High German epics, romances, and other literary genres.

541 Baroque. (3) N; Alexander
Studies in poetry, prose and drama of the 17th and early 18th centuries.

551 Romanticism. (3) F '81; Carlson
Treatment of early and late Romanticism.

555 Modern German Literature. (3) S '82; Laetz
Major works from the period of Expressionism to 1945.

591 Seminar. (3) N; Staff
Special topics are concerned with a figure, theme or work in German literature or Germanic studies. Topics may be selected from the following:

- | | |
|--------------|----------------------|
| (a) Goethe | (e) Kafka |
| (b) Faust | (f) Hesse |
| (c) Schiller | (g) Grass and Boll |
| (d) Kleist | (h) Germanic Studies |

Special Courses: GER 492, 493, 494, 498, 499, 590, 592, 598, 599. (See pages 32-33.)

GREEK

Completion of GRK 101, 201, 301, and 302 will satisfy the Liberal Arts language requirements.

GRK 101 Elementary Greek. (4) F
For beginning students only.

201 Intermediate Greek. (4) S
Continuation of GRK 101. Prerequisite: GRK 101 or approval of instructor.

301, 302 Greek Literature. (3-3) F, S
Readings in the masterpieces of ancient Greek literature; advanced grammar. Authors read are changed each year in accordance with needs of the class. May be repeated for credit. Prerequisite: approval of instructor.

Special Courses: GRK 492, 493, 494, 499. (See pages 32-33.)

ITALIAN

ITA 101, 102 Elementary Italian. (4-4) F, S
Aural/oral drill in class and laboratory, and basic grammar supplemented by simple prose readings. Four lectures, 1 hour laboratory.

201, 202 Intermediate Italian. (4-4) F, S

Intensive review of the fundamentals of Italian grammatical structure to increase the student's ability in composition, translation and idiomatic expression. Prerequisite: ITA 102† or equivalent. Four lectures, 1 hour laboratory.

311, 312 Italian Composition and Conversation. (3-3) F, S

Development of writing ability and oral expression. Prerequisite: ITA 202† or equivalent.

325 Introduction to Italian Literature. (3) S

Italian literature through the interpretation of representative works in drama, poetry and novel. Prerequisite: ITA 312† or approval of instructor.

441 Dante Alighieri: *Divina Commedia.* (3) N

Critical reading of the three *Cantiche* (*Inferno*, *Purgatorio*, *Paradiso*). Prerequisite: ITA 325†.

449 20th Century Italian Literature. (3) N

Major works, figures and movements of contemporary Italian literature. Prerequisite: ITA 325†.

Special Courses: ITA 492, 493, 494, 499. (See pages 32-33.)

JAPANESE

JPN 101, 102 Elementary Japanese. (5-5) F, S

Pronunciation, conversation and structural grammar. Aural/oral drill. Graduated introduction of basic reading and writing skills. Five lectures, 1 hour laboratory.

201, 202 Intermediate Japanese. (5-5) F, S

Grammar review and continued oral practice. Increased emphasis on reading and writing. Prerequisite: JPN 102† or equivalent. Five lectures, 1 hour laboratory.

206 Calligraphy. (1) F, S

Introduction to the practice of calligraphy in Japan with emphasis on the derivation of Japanese *kana* syllabaries from Chinese characters. Prerequisite: CHI 205 or JPN 101.

309, 310 Intermediate Japanese Conversation. (2-2) F, S

Practice in current usage in expression of ideas. Recommended especially for those who have not had the opportunity to practice Japanese in Japan. Prerequisite: JPN 202†.

311, 312 Advanced Japanese Conversation. (2-2) F, S

Intensive aural/oral practice toward conversational fluency. Prerequisite: JPN 202†.

313, 314 Advanced Japanese. (3-3) F, S

Designed to develop skill and accuracy in written Japanese. Prerequisite: JPN 202† or equivalent.

321 Japanese Literature. (3-3) F, S

Readings in representative masterpieces of modern Japanese literature. Authors read change each year in accordance with the needs of the class. May be repeated for credit. Prerequisite: JPN 313† or approval of instructor.

414 Introduction to Classical Japanese. (3) S '83

Readings from various genres of pre-20th century literature, with analysis of the structure of the classical language. Prerequisite: JPN 313† or approval of instructor.

Special Courses: JPN 294, 492, 493, 494, 499, 590. (See pages 32-33.)

LATIN

LAT 101, 102 Elementary Latin. (4-4) F, S

For beginning students only.

201, 202 Intermediate Latin. (4-4) F, S

Selected Latin literature, both classical and post-classical; Vergil's *Aeneid*; advanced grammar. Prerequisite: LAT 102† or approval of instructor.

421, 422 Roman Literature. (3-3) F, S

Readings in the Latin masterpieces. Authors read change each year in accordance with needs of the class. May be repeated for credit. Prerequisite: LAT 202 or approval of instructor.

Special Courses: LAT 492, 493, 494, 499. (See pages 32-33.)

PORTUGUESE

Completion of POR 101, 201, 313, and 314 will satisfy the Liberal Arts Language requirements.

POR 101 Elementary Portuguese. (5) F

Basic grammar with intensive drill in class and laboratory directed toward conversational fluency. Five lectures, 1 hour laboratory. Prerequisite: one year of Spanish, French, or Italian, or approval of instructor.

201 Intermediate Portuguese. (5) S

Continuation of POR 101. Intensive drill of fundamentals in class and laboratory directed toward conversational fluency. Five lectures, 1 hour laboratory. Prerequisite: POR 101 or approval of instructor.

313, 314 Portuguese Composition and Conversation. (3-3) F, S

Designed to develop skill in written Portuguese and corrected oral expression. Must be taken in sequence. Prerequisite: POR 201† or approval of instructor.

321 Luso-Brazilian Literature. (3) F

Representative masterpieces of Portuguese and Brazilian literature from the beginning to the present. Prerequisite: POR 313† or approval of instructor.

472 Luso-Brazilian Civilization. (3) S '83

Lectures, readings and discussion of important aspects of Luso-Brazilian civilization. Topics from music, art, folklore, literature, history and politics. Prerequisite: POR 313† or approval of instructor.

Special Courses: POR 492, 493, 494, 499, 590. (See pages 32-33.)

RUSSIAN

RUS 101, 102 Elementary Russian. (4-4) F, S, SS

Structural grammar and basic vocabulary. Introduction and reinforcement of aural/oral reading and writing skills. Four lectures, 1 hour laboratory.

201, 202 Intermediate Russian. (4-4) F, S, SS

Systematic review of grammar. Development of vocabulary through reading, writing. Drill in aural/oral skills. Prerequisite: RUS 102† or equivalent. Four lectures, 1 hour laboratory.

211, 212 Basic Russian Conversation. (3-3) F, S

Intensive aural/oral drill to supplement reading and grammatical skills acquired in RUS 101, 102†, 201†, and 202†. Required of Russian majors. Prerequisite: RUS 102†.

303, 304 Scientific Russian. (3-3) F, S

Acquisition of scientific vocabulary through reading from current Soviet scientific publications. Prerequisite: RUS 102†.

311, 312 Russian Composition and Conversation. (3-3) F, S

Development of writing ability and oral expression. Prerequisite: RUS 202†.

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321, 322 Survey of Russian Literature. (3-3) F, S

The main literary movements, prominent authors and the most significant works of prose, poetry and drama to the 1917 revolution. Prerequisite: RUS 202† or equivalent.

323 Survey of Soviet Literature. (3) F, S

The main literary movements, prominent authors and the most significant works of prose, poetry and drama of the Soviet period (1917 to present). Prerequisite: RUS 202† or equivalent.

411, 412 Advanced Composition and Conversation.

(3-3) F, S

Designed to improve aural discrimination, self-expression in oral and written skills, emphasizing vocabulary building. Subject materials drawn from current Soviet publications. Prerequisite: RUS 312†.

417, 418 Applied Russian Phonetics. (2-2) F '82; S '83

General improvement in the student's language skills through aural/oral training in Russian phonology and an analysis of Russian orthography. Prerequisite: RUS 312†.

420 Russian Poetry. (3) N

Development of Russian poetry from its beginnings to the present, including both native and emigré poets. Topics in criticism and the study of poetics. Prerequisite: RUS 312† or approval of instructor.

421 Pushkin. (3) N

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: RUS 312† or approval of instructor.

423 Dostoyevsky. (3) N

Dostoyevsky's major works of fiction, including *Crime and Punishment* and *Brothers Karamazov*. Prerequisite: RUS 312† or approval of instructor.

424 Tolstoy. (3) N

Tolstoy's major works, including *War and Peace* and *Anna Karenina*. Prerequisite: RUS 312† or approval of instructor.

425 Chekhov. (3) N

Chekhov's major works, representative short stories and major plays, including *The Cherry Orchard* and *Three Sisters*. Prerequisite: RUS 312† or approval of instructor.

426 Soviet Literature. (3) N

Thematic development of Soviet literature (1917 to present) through representative authors and works, including Gorky, Blok, Mayakovsky, Zamyatin, Olesha, Babel, Iff and Petrov, Sholokhov, Pasternak, Yevtushenko, and Solzhenitsyn. Prerequisite: RUS 312† or approval of instructor.

440 History of the Russian Language. (3) N

Principles of historical linguistics presented through the evolution of the Russian language from Proto-Indo-European to the present. Readings of historical documents in Old Russian and Old Church Slavic. Prerequisite: RUS 312† or approval of instructor.

441 Survey of Russian Culture. (3) N

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: RUS 312† or approval of instructor.

591 Seminar. (3) N

Topics may be selected from the following:

- Pre-19th Century Russian Literature
- 19th Century Russian Literature
- Russian Poetry to 1890
- Russian Poetry, 1890 to Present
- Russian Literary Criticism

(f) Soviet Socialist Realism

(g) Contemporary Soviet Authors

Special Courses: RUS 492, 493, 494, 499, 590. (See pages 32-33.)

SPANISH

SPA 101, 102 Elementary Spanish. (4-4) F, S, SS

Fundamentals of the language. Not open to students with credit in SPA 111. Four lectures, 1 hour laboratory.

111 Fundamentals of Spanish. (4) F, S

Primarily for students with two years of high school Spanish who need review to enter second year study. Not open to students with credit in SPA 102. Four lectures, 1 hour laboratory.

201, 202 Intermediate Spanish. (4-4) F, S, SS

Continuation of fundamentals. Emphasis on the development of the skills of reading, listening comprehension, speaking and writing. Prerequisite: SPA 102† or 111. Four lectures, 1 hour laboratory.

203, 204 Intermediate Spanish for Bilinguals. (4-4) F, S

Designed to meet the needs of the Spanish-speaking student. May be taken in lieu of 201-202. Emphasis on composition, literature, conversation and review of grammar fundamentals. Prerequisite: SPA 102† or 111 or placement. Four lectures, 1 hour laboratory.

311, 312 Spanish Conversation. (3-3) F, S

Designed primarily for non-majors to promote facility in coherent and expressive diction in Spanish. Prerequisite: SPA 202† or equivalent.

313, 314 Spanish Conversation and Composition. (3-3) F, S, SS

Designed to develop skill and accuracy in spoken and written Spanish. Required of majors; to be taken in sequence. Prerequisite: SPA 202† or equivalent.

315, 316 Spanish Conversation and Composition for Bilinguals. (3-3) F, S

Designed to meet the needs of the Spanish-speaking student. May be taken in lieu of 313-314. Prerequisite: 202† or 204† or approval of instructor.

319 Business Correspondence and Communication. (3) S

Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: SPA 314† or 316† or approval of instructor.

325 Introduction to Hispanic Literature. (3) F, S

A critical approach to and analysis of literary types: poetry, drama, short story and novel. Required of all majors. Prerequisite: SPA 202† or 204†.

412 Advanced Conversation and Composition. (3) F, S

Oral and written Spanish communication skills, with particular attention given to developing fluency and facility. Required of majors. Prerequisite: SPA 314† or 316† or approval of instructor.

413 Advanced Spanish Grammar. (3) F

Intensive analysis of the Spanish language. Required of teaching majors. Prerequisite: SPA 314† or 316† or approval of instructor.

417 Spanish Phonetics and Phonology. (3) F '81; Foster, Lafford

Introduction to the theory and practice of Spanish phonetics and phonology. Prerequisite: SPA 314†, or 316†.

- 420 Applied Spanish Linguistics.** (3) S; Barkin, Sheppard
Application of linguistic principles to the acquisition, analysis and teaching of Spanish. Prerequisite: FLA 400 or any other introductory linguistics course.
- 421 Spanish in the Southwest.** (3) F '81, S '83; Acevedo, Martínez
Analysis of Southwest spoken and written Spanish as compared to standard Spanish. Designed for students preparing for bilingual-bicultural work. Prerequisite: SPA 314† or 316† or approval of instructor.
- 424 Masterpieces of Hispanic Literature.** (3) F, S
Selections from the literature of the Hispanic world and discussion of its cultural background. Required of but not limited to teaching majors. Prerequisite: SPA 325†.
- 425, 426 Spanish Literature.** (3-3) F, S
Survey of Spanish literature from its beginning to the present. Prerequisite: SPA 325†.
- 427, 428 Spanish-American Literature.** (3-3) F, S
Survey of major works, figures and movements from Colonial period to 1880 and from 1880 to present. Prerequisite: SPA 325†.
- 434 Drama of the Golden Age.** (3) S '83; Binger, Martínez
Dramatic works of Lope de Vega, Calderón de la Barca and their contemporaries. Prerequisite: SPA 325†.
- 435 Cervantes - *Don Quijote*.** (3) F '82; Friedman
Don Quijote and the development of the novel. Prerequisite: SPA 325†.
- 436 Generation of 1898.** (3) F '81; Flys, Vasquez
Works of Unamuno, Baroja, Azorín and their contemporaries, studied against the ideological background of the turn of century in Spain. Prerequisite: SPA 325†.
- 437 20th Century Spanish Poetry.** (3) S '82; Flys, Knowlton
Major trends in Spanish poetry from Modernism to present. Prerequisite: SPA 325†.
- 454 19th Century Spanish American Narrative.** (3) S '82; Luenow, Virgillo
Principal works in the novel, short story, narrative fiction and narrative (Gauchoesque) poetry. Prerequisite: SPA 325†.
- 455 Spanish American Modernism.** (3) S '83; Luenow, Virgillo
Principal works and figures of literary Modernism, 1880-1920; emphasis on international literary context of the movement. Prerequisite: SPA 325†.
- 456 20th Century Spanish American Fiction.** (3) F '82; Foster, Volek
Major works and movements. Prerequisite: SPA 325†.
- 457 Contemporary Spanish American Poetry.** (3) F '81; Ahern, Volek
Major works and problems in contemporary poetry and poetics with emphasis on Paz, Parra, Cardenal and new poetry since 1960. Prerequisite: SPA 325†.
- 464 Mexican American Literature.** (3) F; Acevedo, Alarcón
Representative literature in Spanish and English by Mexican Americans, emphasizing socio-cultural as well as literary values. Prerequisite: SPA 325†.
- 471 Civilization of the Spanish Southwest.** (3) S; Acevedo, Alarcón
The political, intellectual, social, economic and artistic development of the Spanish-speaking people of the Southwest. Prerequisite: SPA 314† or 316† or approval of instructor.
- 472 Spanish-American Civilization.** (3) F; Curran
Growth of the institutions and cultures of Spanish-American people. Prerequisite: SPA 314† or 316† or approval of instructor.
- 473 Spanish Civilization.** (3) S; Flys, Valdivieso
Political, intellectual, social, economic and artistic development of the Spanish nation from its origin to the present. Prerequisite: SPA 314† or 316† or approval of instructor.
- 500 Bibliography and Research Methods.** (3) F; Foster, Valdivieso
Required of all graduate students.
- 540 History of the Spanish Language.** (3) S; Lafford, Martínez
Linguistic development of the Spanish language from the epoch of Vulgar Latin to the present day.
- 541 Spanish Language in America.** (3) F '81; Foster, Lafford
The major dialects of Spanish in the Americas and their historical, social and cultural development. Prerequisite: SPA 540 or approval of instructor.
- 542 Studies in the Spanish of the Southwest.** (3) S '82; Barkin
Examination of bilingualism and the social and regional dialects of Spanish in the Southwest. Prerequisite: FLA 400 or equivalent.
- 543 Structure of Spanish.** (3) F '83; Foster, Lafford
Analysis and discussion, within the framework of contemporary linguistic theories, of selected problems in Spanish morphophonology, syntax, and semantics. Prerequisite: FLA 400 or equivalent.
- 545 Concepts of Literary Criticism.** (3) F '8; Foster, Volek
Aims and methods of modern literary scholarship. Discussion of major theories of literary analysis.
- 560 Medieval Spanish Literature.** (3) N; Friedman, Martínez
Major figures and works of the Middle Ages in Spain.
- 561 Golden Age Spanish Prose Fiction.** (3) N; Friedman
Major figures and works of the 16th and 17th centuries, with emphasis on the picaresque novel.
- 562 Golden Age Spanish Poetry.** (3) N; Flys, Sheppard
Major figures and works of the 16th and 17th centuries, with emphasis on lyric poetry.
- 563 Spanish Romanticism.** (3) N; Knowlton
Principal figures and works of the Spanish Romanticism, with emphasis on international literary context of the movement.
- 564 19th Century Spanish Prose Fiction.** (3) N; Virgillo
Principal figures and works of Realism in the 19th century novel, with emphasis on Galdós.
- 565 20th Century Spanish Drama.** (3) N; Martínez, Valdivieso
Principal figures and works of Spanish dramatic literature from the Generation of 1898 to the present.
- 566 Generation of 1927.** (3) N; Flys, Knowlton
Major poets of the Generation of 1927, with emphasis on works of Lorca, Guillén, Salinas and Aleixandre.
- 567 Contemporary Spanish Novel.** (3) N; Alarcón, Vasquez
Major works of post-Civil War Spanish fiction.
- 570 Indigenous Literatures of Spanish America.** (3) N; Ahern
The indigenous literary traditions with emphasis on

Nahuatl, Mayan and Quechua literatures through readings in Spanish translations.

571 Colonial Spanish American Literature. (3) N; Ahern, Luenow

The major figures and works from Conquest to Independence.

572 Spanish American Drama. (3) N; Foster

Major contributions of Spanish American drama, with emphasis on contemporary dramatists.

573 Spanish American Essay. (3) N; Foster, Virgillo

Major works of the essay within the framework of intellectual history and literary movements.

574 Spanish American Vanguard Poetry. (3) N; Ahern, Volek

Examination of poetic developments, 1920-1940, with emphasis on Huidobro, Vallejo, Neruda and the international context of their works.

575 Contemporary Spanish American Novel. (3) N; Foster, Volek

Principal novels of the *Nueva Narrativa Hispanoamericana*, within the context of contemporary theories of the narrative.

576 Contemporary Spanish American Short Story. (3) N; Ahern, Foster

Principal short stories of the *Nueva Narrativa Hispanoamericana*, within the context of contemporary theories of the narrative.

577 Regional Spanish American Literature. (3) N; Ahern (Peru); Foster (Argentina and Chile); Luenow (Mexico); Volek (Caribbean)

The figures and works of major national and regional literatures. Topics offered on a rotating basis. May be repeated for different topics.

579 18th Century Hispanic Literature. (3) N; Binger, Virgillo

The literature of the Enlightenment in Spain and Colonial Spanish America.

591 Seminar. (3) N; Staff

Spanish and Spanish American literary, cultural, and linguistic topics.

691 Figures and Works Seminar. (3) N; Staff

Topics may be selected from Spanish and Spanish American literatures.

Special Courses: SPA 294, 298, 484, 492, 493, 494, 497, 498, 499, 580, 590, 592, 594, 598, 599, 692, 799. (See pages 32-33.) Prerequisite for SPA 590: approval of instructor, advisor and department chair. Secure forms in the Foreign Languages office.

Geography

PROFESSORS:

McTAGGART (COB 338), DURRENBERGER, HARING, LOUNSBURY, MARCUS, PARKER, WEIGEND

ASSOCIATE PROFESSORS:

ACKER, ALDRICH, BRAZEL, COMEAUX, GOBER, GRAF, MINGS, SARGENT, ZONN

ASSISTANT PROFESSORS:

FROST, HENKEL, PASQUALETTI

Departmental Major Requirements

Bachelor of Arts and Bachelor of Science Degree Curricula

Geography—Consists of 45 semester hours of credit. The required courses are GPH 111 or 411; 371 and 491; GCU 102, 375, and 495; an additional 3- or 4-hour course in GPH; an additional 3-hour course in GCU; and a 3-hour course in regional geography. A further 4-6 hours of electives must be chosen, for a total of 36 hours in geography. The remaining 9 hours are to be made up of electives from related fields of study, chosen in consultation with an advisor. At least 18 hours must be in upper division courses. In addition, the Bachelor of Arts degree carries a foreign language requirement (see Graduation Requirements, page 39).

Area Studies Emphasis. (See interdisciplinary studies, pages 51-58.)—Consists of the Bachelor of Arts degree requirements in geography, along with additional requirements in the fields of Latin American Studies or Asian Studies.

For the *Latin American Studies Emphasis*, at least 30 upper division semester hours of the program must be in Latin American content courses, including 15 hours in geography (or in courses approved by the geography advisor) and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a bachelor's degree with a major in Geography—Latin American Studies.

For the *Asian Studies Emphasis*, the program requires 30 semester-hours of wholly Asian content courses, selected from the list drawn up by the Center for Asian Studies.

Also required is knowledge of an Asian language; this is deemed to be fulfilled by 16 semester hours of credit or the equivalent in Chinese, Japanese, or any other Asian language approved by the Center in respect of any individual program.

Special Emphasis Programs—Two special emphasis programs, Urban Studies and Meteorology-Climatology, are available within the Bachelor of Science degree curriculum in geography.

Urban Studies Emphasis—The required courses are GPH 111 or 411; 371 and 491; GCU 102, 359 or 360, 361, 357, 375, 444† and 495. In addition, students must select one 3-hour regional course, and one from the following list of options: GCU 351, 352, 401†, 442†, 453†, 461, and GPH 481. If GPH 481 is not selected, a further 3-hour course in GPH is required. At least 9 of the 15 hours in fields related to geography must be in urban-oriented course work.

Meteorology-Climatology Emphasis—The required courses are GCU 102, 375 or 495, GPH 212, 213, 214, 215, 310†, 311†, 371, 412†, 413†, 491. Students must also choose one regional course and any other 3-hour course in GCU. Also required are the following related courses: ESE 474, 475, MAT 270†, 271†, 272† (or MAT 290†, 291†), PHY 111†, 112†, 113†, and 114†. Completion of this program satisfies the criteria for employment with the National Weather Service.

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 30 must be in geography and 15 in a related teaching field or fields. Departmental minor teaching field requirements (Elementary and Secondary Education) consists of a minimum of 24 semester hours of credit. Courses GPH 111 or 411 and GCU 121 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 Master of Arts and Doctor of Philosophy degrees. Consult the *Graduate Catalog* for requirements.

CULTURAL GEOGRAPHY

Courses which may be applied toward the General Studies requirement in social and behavioral sciences.

GCU 102 Introduction to Human Geography. (3) F,S
Systematic study of human use of the earth. Spatial organization of economic, social, political and perceptual environments.

121 World Geography. (4) F,S
Description and analysis of areal variations in social, economic and political phenomena in major world regions.

141 Introduction to Economic Geography. (3) F,S
Production, distribution and consumption of various types of commodities of the world and relationships to the activities of man.

209 Introduction to the Study of Energy. (3) F
An integrative, non-technical introduction to many aspects of energy, including: power plants, resources, life-styles, environment, geography, economics, policy. Field trip.

253 Introduction to Cultural and Historical Geography. (3) F,S
Cultural patterns, including such phenomena as language, religion and various aspects of material culture. Origins and diffusion and division of the world into cultural areas.

322 Geography of Anglo-America. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in the United States and Canada.

323 Geography of Latin America. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in South, Middle and Caribbean America.

325 Geography of Europe. (3) S
Spatial distribution of relevant physical, economic and cultural phenomena in Europe. Recommended for social studies teachers and students of European history.

326 Geography of Asia. (3) S
Spatial distribution of relevant physical, economic and cultural phenomena in Asia, excluding the U.S.S.R.

327 Geography of Africa. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in Africa.

350 The Geography of World Crises. (3) F
Contemporary world crises viewed from a perspective of geographic concepts and techniques.

351 Population Geography. (3) S
Demographic patterns, spatial, temporal and structural investigation of the relationship of demographic variables to cultural, economic and environmental factors.

352 Political Geography. (3) S
Relationship between the socio-physical environment and the state.

357 Social Geography. (3) F
Environmental perception of individuals and groups. The spatial aspect of social and physical environments is stressed.

359, 360 Cities of the World. (3-3) A
Historical development and evolution of the earth's urban patterns; internal structure of selected world cities. First semester, Ancient Cities through 18th century; second semester, 19th and 20th centuries.

88 GEOGRAPHY

- 361 Urban Geography.** (3) F, S
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.
- 364 Geography of Energy.** (3) F
Production, transportation and consumption of energy, emphasizing the electric power industry and its environmental problems.
- 375 Introduction to Geographic Research Methods.** (3) S
Scientific techniques used in geographic research. Prerequisite: approval of instructor.
- 401 Topics in Cultural, Economic and Political Geography.** (1-3) F, S, SS; Staff
Open to students qualified to pursue independent studies. Field trips may be required. Prerequisite: approval of instructor.
- 421, 423, 424, 426, 428, 431, 432:** Following courses concern spatial distribution of relevant physical, economic and cultural phenomena in the area designated.
- 421 Geography of Arizona and Southwestern United States.** (3) F, S; Comeaux; Henkel
- 423 Geography of South America.** (3) F; Frost, Henkel
Prerequisite: GCU 323 or approval of instructor.
- 424 Geography of Middle America.** (3) S; Frost, Mings
Central America. Prerequisite: GCU 323 or approval of instructor.
- 426 Geography of the Soviet Union.** (3) S; Weigend
Prerequisite: GCU 121 or approval of instructor.
- 428 Geography of Middle East.** (3) N; Henkel
The Near East, emphasizing current political and economic developments. Prerequisite: GCU 121 or approval of instructor.
- 431 Geography of the Far East.** (3) N; McTaggart
Japan, China, Korea, excluding the U.S.S.R. Prerequisite: GCU 326 or approval of instructor.
- 432 Geography of Sub-Saharan Africa.** (3) N; Henkel
A regional analysis, emphasizing south of the Sahara. Prerequisite: GCU 327 or approval of instructor.
- 441 Economic Geography.** (3) F, S; Gober, Mings
Spatial distribution of primary, secondary and tertiary economic and production activities. Prerequisite: GCU 141 or approval of instructor.
- 442 Geography of Transportation.** (3) N; Mings, Gober
Geographic analysis of world trade routes and transportation systems. Prerequisite: GCU 141 or 441.
- 444 Applied Urban Geography.** (3) N; Sargent
Designed to prepare the student for employment in planning agencies. Includes application of urban geographic principles to present day planning problems. Prerequisite: GCU 361.
- 453 Recreational Geography.** (3) S; Mings
Examination of problems surrounding the organization and use of space for recreation. Introducing geographic field survey methods of data collection and analysis. Saturday field trips may be required.
- 455 Historical Geography of Anglo-America.** (3) N; Comeaux
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.
- 461 Geographic Applications of Urban and Regional Planning.** (3) N; McTaggart, Sargent
Philosophy of the planning concept, nature and function of planning commissions and development of comprehensive plans. Prerequisites: GCU 361 or 444† or approval of instructor.
- 462 Geography of Food and Famine.** (3) S; Parker
Spatial distribution of relevant physical, economic and cultural factors influencing production and consumption of foodstuffs. Field trips may be required.
- 495 Quantitative Methods in Geography.** (3) S; Zonn, Gober
Statistical techniques applied to the analysis of spatial distributions and relationships. Introduction to models and theory in geography. Prerequisite: MAT 106 or approval of instructor.
- 501 Geography Colloquium.** (1) N; Staff
New trends in the discipline; current research being conducted by geography students, faculty and invited guests. May be repeated for credit.
- 524 Geographic Area Analysis.**(3) F; Lounsbury
Examination of area development within a spatial context. Geographic methodologies associated with microanalysis of pertinent physical, social and economic factors. Prerequisites: 15 hours of geography and approval of instructor.
- 525 Geographic Regional Analysis.** (3) S; Gober
Examination of regional growth within a spatial context. Contemporary theory and methodology in regional science emphasizing application in geographic and macro-land use analysis. Prerequisites: 15 hours in geography and approval of instructor.
- 526 Spatial Land Use Analysis.** (3) S; Lounsbury, Sargent
Determination, classification, and analysis of spatial variations in land use patterns. Examination of the processes affecting land use change. Prerequisite: 15 hours of geography or approval of instructor.
- 529 Contemporary Geographic Thought.** (3) S; Marcus, Gober
Comparative evaluation of current philosophy concerning the nature and trends of geography. Prerequisites: 15 hours of geography and approval of instructor.
- 585 Advanced Research Methods in Geography.** (3) F; Brazel, Zonn
Specialized research techniques and methodologies in economic, political or cultural geography.
- 591 Seminar.** (3) F, S, SS; Staff
Selected topics in economic, political or cultural geography. Field trips may be required.
- 596 History of Geographic Thought.** (3) N; Comeaux
Development of geographic thought from Herodotus and Strabo to Humboldt and Ritter.
- Special Courses:** GCU 492, 497, 498, 499, 500, 580, 584, 590, 592, 594, 598, 599, 600, 680, 683, 684, 690, 691, 692, 700, 780, 784, 790, 791, 792, 799. (See pages 32-33.)

PHYSICAL GEOGRAPHY

Courses which may be applied toward the General Studies requirement in sciences and mathematics.

GPH 111 Introduction to Physical Geography. (4) F, S
Spatial and functional relationships among climates, landforms, soils, water and plants. Three lectures, 3 hours laboratory. Field trips are required.

210 Physical Environment. (3) F
Principles of physical geography relating to environmental problems pertinent to contemporary society. Pollution, maladjusted land use, resource exploitation.

211 Introduction to Landforms. (3) S

Geographic characteristics of major types of landforms, stressing areal association by use of maps. Field trips are required. Prerequisite: GPH 111. Two lectures, 3 hours laboratory.

212, 213 Introduction to Meteorology I, II. (3-3) A

Atmospheric processes and elements. General and local circulation, heat exchange and atmospheric moisture. Students whose curricula require a laboratory course must also register for GPH 214†, 215†. Prerequisite: GPH 111 or approval of instructor.

214, 215 Introductory Meteorology Laboratory. (1-1) A
Introduction to meteorological observations and measurement. Numerical and cartographic interpretation of weather data. May be taken concurrently with, or subsequent to, GPH 212†, 213†, respectively. Three hours laboratory.

271 Maps and Map Reading. (3) F

Techniques of interpretation of the many types of maps, map projections and history of mapping. Field trips are required. Prerequisite: GPH 111.

310, 311 Synoptic Meteorology I, II. (4-4) F '81; S '82

Diagnostic techniques and synoptic forecasting. Includes practical operation of field stations and techniques of weather analysis. Field trips are required. Prerequisite: GPH 212†, 213† or approval of instructor. Three lectures, 3 hours laboratory.

317 Marine Geography. (3) F, S

Spatial analysis of the physical characteristics and potential economic and cultural resources of the oceans. Prerequisite: GPH 111 or 411, or approval of instructor.

371 Cartography. (3) F, S

Basic map drafting, grid compilation, simple design and use of cartographic instruments. Field trips are required. Prerequisites: GPH 111 and 271† or approval of instructor. Six hours laboratory.

372 Air Photo Interpretation. (3) S

Aerial photographs as a means of determining topography, vegetation and culture; scale, use of index, vertical and oblique photographs and stereoscopes. Prerequisites: GPH 111, 211†.

381 Geography of Natural Resources. (3) S

Nature and distribution of natural resources and the problems and principles associated with their use.

401 Topics in Physical Geography. (1-3) F,S,SS: Staff

Open to students qualified to pursue independent studies. Field trips may be required. Prerequisite: approval of instructor.

405 Energy and Environment. (3) S

Sources, regulatory and technical controls, distribution, and consequences of the supply and human use of energy. Prerequisites: students are expected to have taken courses in the physical and/or life sciences as preparation; or approval of instructor.

411 Physical Geography. (3) F,S; Brazel, Graf, Marcus

Introduction to physiography and the physical elements of the environment. Open only to students who have not taken GPH 111. Field trips are required.

412 Physical Climatology. (3) S; Marcus, Brazel

Physical processes of the earth-atmosphere system on regional and global scales; concepts and analysis of energy, momentum and mass balances. Field work required. Prerequisite: GPH 212†-213† or 310†, or approval of instructor.

413 Meteorological Instruments and Measurement. (3) S

'81; Brazel, Durrenberger
Design and operation of ground-base and aerological

weather measurement systems. Collection, reduction, storage, retrieval and analysis of data. Field trips are required. Prerequisite: GPH 212†, 213†, or approval of instructor.

414 Climatic Analysis. (3) F; Durrenberger

Processes that produce variations in climate over time and space. Includes changes in climate produced by human and natural forces and involves the analysis of climatic data to identify temporal and spatial variations. Prerequisite: GPH 212† or approval of instructor.

433 Alpine and Arctic Environments. (3) F; Marcus

Regional study of advantages and limitations of the natural environment upon present and future problems involving resource distribution, human activities and regional and interregional adjustments. Field trips are required. Prerequisite: GPH 111 or approval of instructor.

481 Environmental Geography. (3) S; Marcus, Pasqualetti

Problems of environmental quality including uses of spatial analysis, research design and field work in urban and rural systems. Field trips are required. Prerequisite: approval of instructor.

491 Geographic Field Methods. (6) SS; Staff

Field techniques including use of aerial photos, large-scale maps, fractional code system of mapping; urban and rural field analysis to be done off campus; travel fees required. Prerequisite: approval of instructor.

571 Computer Mapping and Graphics. (3) F; Aldrich

Utilization of the digital computer in analysis and mapping of geographic data. Includes plotting, surficial display, compositing and graphics. Field trips are required. Prerequisites: GPH 371† and approval of instructor.

575 Geographic Applications of Remote Sensing. (3) S; Aldrich

Use of imaging and non-imaging methods of remote acquisition of data, including satellite sensors, airborne radar, multiband scanning, conventional photographic sensors and ground based equipment. Field trips are required. Prerequisites: GPH 372†, GCU 585 or GPH 491†.

581 Resource Development. (3) S; Pasqualetti

Resource dynamics including the physical, economic, cultural, political and historical factors influencing production and consumption patterns. Prerequisites: GPH 381, 481† or equivalent.

591 Seminar. (3) F,S; Staff

Selected topics in physical geography. Field trips may be required.

Special Courses: GPH 484, 492, 497, 498, 499, 500, 580, 584, 590, 592, 598, 599, 600, 680, 683, 684, 690, 691, 692, 700, 780, 784, 790, 791, 792, 799. (See pages 32-33.)

Geology

PROFESSORS:

KRINSLEY (PS F-686), BUSECK, DIETZ,
GREELEY, HOLLOWAY, LARIMER, LUNDIN,
MOORE, NAVROTSKY, PÉWÉ, RAGAN,
SHERIDAN

ASSOCIATE PROFESSORS:

BURT, FERRY, KNAUTH

ASSISTANT PROFESSORS:

GREGORY, MALIN, SELF, STUMP, VEBLÉN,
YUEN

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Geology—Consists of 45 semester hours. Courses GLG 100 or 101 or 301, 102, 310†, 321†, 335†, 336†, 423, 424† and 435† or their equivalents are required. Supporting courses required in related fields: CHM 113†, 116†; PHY 111†, 112†, 113†, 114†; MAT 118†, 226†. The additional work necessary to complete the major must be taken from the departmental list of approved courses. GLG 472, 480† cannot be used to fulfill the requirements for a major. (See Graduation Requirements, page 39.)

Bachelor of Science Degree Curriculum

Geology—45 semester hours are required, including the following basic courses or their equivalent: GLG 100 or 101 or 301, 102, 310†, 321†, 335†, 336†, 423, 424†, 435† and 450†. Supporting courses required in related fields are CHM 113†, 116†; PHY 115†, 116† (PHY 111†, 112†, 113†, 114† are acceptable alternatives); MAT 290†, 291† or MAT 270†, 271†, 272†. To complete the total required hours, other courses in geology or in related fields listed by the department as approved may be taken. GLG 472 and 480† cannot be used to fulfill the requirements for a major. One year of foreign language is required. French, German or Russian is strongly recommended. (See Graduation Requirements, page 39.)

Bachelor of Arts in Education Degree Curriculum

Departmental Teaching Major

Geology—Consists of 42 semester hours of credit of which a minimum of 30 will be in geology. The following courses in geology or

their equivalents are required: GLG 100 or 101, 102, 310†, 321†, 335†, 336†, 362†, or 435† and 423. Additional courses and substitutions that are necessary to complete the major will be selected from geology and closely related fields as approved by the student's advisor. Supporting courses required in related fields are: CHM 113†, 116†; PHY 111†, 112†, 113†, 114†; MAT 118†. GLG 480† is required in the professional education program.

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): GLG 100 or 101, 102, 480†. Any of the following courses or their equivalent may be used to complete a minor in Geology (Earth Science): GLG 310†, 321†, 335†, 336, 352†, 400, 423, 424†, 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 degrees of Master of Science and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

GEOLOGY

GLG 100 General Geology. (4) F,S,SS

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. Both GLG 100 and 101 may not be taken for credit. Possible field trips.

101 Physical Geology. (4) F,S

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. Three lectures, 3 hours laboratory. Some field trips during laboratory, possible weekend field trips.

102 Historical Geology and Modern Problems. (4) S
Basic principles of applied geology and the use of these principles in the interpretation of geologic history. Laboratory techniques involving map interpretation, cross sections, and fossils. Three lectures, 3 hours laboratory. Some field trips during laboratory, possible weekend field trips.

105 Introduction to Planetary Science. (3) F

Planets, asteroids, comets and meteorites: their geological evolution, surfaces, interior, atmospheres, exobiology. Terraforming and space colonies.

220 Rocks, Minerals and Gemstones. (3) N

Identification and classification of specimens with special reference to Arizona. Possible weekend field trips. Not open to students with credit in GLG 321.

300 Geology of Arizona. (3) F,S

Basic and historical geology, fossils, mining, energy resources, environmental problems, landscape development and meteorites, cast in examples from Arizona. Three lectures.

301 Geology for Engineers. (3) N

Physical geology emphasizing structural geology, ground water and relation of geology to engineering problems. Two lectures, 3 hours laboratory. Some field trips during laboratory.

302 Man and Geologic Environment. (3) F

Geologic hazards, problems of waste disposal and land-use planning, environmental problems related to solid earth.

303 Geology of Arizona Laboratory. (1) F,S

Laboratory for GLG 300, 2 hours. Weekend field trip to Grand Canyon.

304 Geology of the Grand Canyon. (2) N

Review of the discovery, history, origin and geology of the Grand Canyon of the Colorado River in Arizona. Six day field trip down the river (first six days after commencement in May) required at student's expense. Field research and term paper on trip also required.

305 Geology of the Earth, Moon and Planets. (3) S

Geological studies of the planets and satellites through the analysis of spacecraft data, and field studies. Weekend field trips.

310 Structural Geology. (3) S

Geologic structures and the mechanical processes involved in their formation. Prerequisites: GLG 101 or 301. Two lectures, 3 hours laboratory. Possible field trips.

321 Mineralogy. (4) F

Crystallography, crystal chemistry and crystal physics as applied to minerals; determinative methods; origin and occurrence; hand specimen study. Prerequisites: MAT 118†; CHM 116† or concurrent enrollment. Three lectures, 3 hours laboratory. Possible field trips.

335 Principles of Paleontology. (2) F

Emphasis on preservation, growth, species concept, and evolution as demonstrated by the fossil record. Prerequisite: GLG 102 or approval of instructor. Geology majors must enroll concurrently in GLG 336. Two lectures.

336 Invertebrate Paleontology. (3) F

Biology, skeletal morphology and systematics of fossil invertebrates. Prerequisite GLG 102 or approval of instructor. Corequisite for geology majors: GLG 335. One lecture-discussion, 6 hours laboratory. Possible field trips.

362 Geomorphology. (3) N

Land-forms and processes which create and modify them. Laboratory and field study of physiographic features. Prerequisites: GLG 101, 310†, 424† or concurrent enrollment. Two lectures, 3 hours laboratory. Some field trips during laboratory; possible weekend field trips.

400 Geology Colloquium. (1) F,S

Presentation of recent research by geology students, faculty, and invited guests. Required at least 3 out of 4 semesters for junior and senior geology majors. May be repeated for a total of 4 credits. Prerequisite: two courses in the department or approval of instructor.

405 Geology of the Moon. (3) F '81

Current theories of the origin and evolution of the Moon through photogeological analyses and consideration of geochemical and geophysical constraints. Prerequisite:

GLG 105 or 305 or approval of instructor. Possible weekend field trip.

406 Geology of Mars. (3) F '82

Geological evolution of Mars through analyses of spacecraft data, theoretical modelling, and study of terrestrial analogs; emphasis on current work. Prerequisite: GLG 105 or 305 or approval of instructor. Possible weekend field trip.

412 Geotectonics. (3) F

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: GLG 310†.

418 Geophysics. (3) F

Solid earth geophysics; geomagnetism, gravity, seismology, heat flow, emphasizing crust and upper mantle. Prerequisites: GLG 101 or 301, PHY 112†, 114†, MAT 291† or approval of instructor. Two lectures, 3 hours laboratory. Some field trips during laboratory; possible weekend field trips.

419 Thermal-Mechanical Processes in the Earth. (3) S

Emphasis on applied mathematical techniques, heat conduction problems in geology, thermal convection, stresses in the lithosphere, viscoelastic processes in the Earth. Prerequisites: PHY 115†, 116†.

420 Volcanology. (3) N

Distribution of past and present volcanism, types of volcanic activity, mechanism of eruption, form and structure of volcanoes, geochemistry of volcanic activity. Prerequisite: GLG 424†. Possible weekend field trips.

423 Optical and X-ray Techniques. (2) S

Polarizing microscopy, optical crystallography and mineralogy. Introduction to X-ray techniques. Corequisite: GLG 321†. One lecture, 3 hours laboratory.

424 Petrology-Petrography. (4) F

Theoretical and laboratory study of the origin and classification of igneous and metamorphic rocks. Hand specimen and thin section study of rocks. Prerequisites: GLG 321†, 423†. Three lectures, 3 hours laboratory. Possible weekend field trips.

435 Sedimentology. (3) S

Origin, transport, deposition and diagenesis of sediments and sedimentary rocks. Physical analysis, hand specimen examination and interpretation of rocks and sediments. Prerequisites: GLG 102, 321†, 423†. Two lectures, 3 hours laboratory. Possible weekend field trips.

436 Principles of Stratigraphy. (3) S

Sources of sediments, depositional environments and the principles in delimiting, correlating and naming of stratigraphic units. Prerequisites: GLG 102, 335†, 435†. Three lectures. Possible weekend field trips.

441 Ore Deposits. (3) N

Origin, occurrence, structure and mineralogy of ore deposits. Prerequisites: GLG 424† or approval of instructor. Three lectures. Possible weekend field trips.

92 GEOLOGY

446 Ground Water Geology. (3) N

Principles governing the occurrence, movement, quality, classification and recovery of underground water, with special reference to Arizona. Prerequisite: GLG 435†. Possible field trips.

450 Geology Field Camp. (6) SS

Geological mapping techniques on aerial photos and topographic maps. Prerequisites GLG 310, 321. Field based with excursions.

462 Environmental Geology of Cold Regions. (3) N

Geological and engineering 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. Prerequisites: GLG 101, 435†; PHY 111† and 113†, or approval of instructor. Possible weekend field trips.

472 Earth Science. (3) F, S

Principles of earth science and their influence in forming the scenic features on the surface of the earth. GLG 472 cannot be taken for credit by one who has completed GLG 100 or 101 or their equivalents. Possible field trips.

481 Geochemistry. (3) F

Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere. Prerequisites: CHM 341† or 441† or GLG 321†. (Same as CHM 481.)

482 Physical Geochemistry. (3) N

Applications of thermodynamic and kinetic principles to geochemical processes. Prerequisite: GLG 321† or CHM 341 or 417† or 441†. (Same as CHM 482.)

485 Meteorites and Cosmochemistry. (3) N

Chemistry of meteorites and their relationship to the origin of the earth, solar system and universe. Prerequisite: GLG 481† or 482†. (Same as CHM 485.)

490 Topics in Geology. (1-3) F, S, SS

Special topics in following fields: mineralogy, petrology, economic geology, geochemistry, petroleum geology, regional geology, geomorphology, geophysics, planetary geology, paleontology, stratigraphy, sedimentology, field geology and structural geology. Prerequisite: approval of instructor. May be repeated for credit.

501 Geology of Arizona. (3) F, S; Stump

Basic and historical geology, fossils, mining, energy resources, environmental problems, landscape development, and meteorites, cast in examples from Arizona. Three lectures. Research paper required.

502 Geology Colloquium. (1) F, S; Staff

Presentation of recent research by geology students, faculty, and invited guests. May be repeated for a total of 4 credits. Prerequisite: two courses in the department or approval of instructor.

503 Man and Geologic Environment. (3) F; Péwé

Geological hazards, mineral and energy resources, problems of waste disposal and land-use planning, environmental problems related to solid earth.

504 Geology of the Grand Canyon. (2) S; Péwé

Review of the discovery, history, origin and geology of the Grand Canyon of the Colorado River in Arizona. Six day field trip down the river (first six days after commencement in May) required at student's expense. Field research and term paper on trip also required.

505 Geology of Arizona Laboratory. (1) F, S; Stump

Laboratory for GLG 501, 2 hours. Weekend field trip to the Grand Canyon.

510 Advanced Structural Geology. (3) N; Ragan

Mechanics of rock deformation, emphasizing relationship between field observation, theory and experiment. Stress,

strain, simple constitutive relationships, failure criteria, and the basis of continuum methods. Prerequisites: GLG 310†, 424† or approval of instructor. Possible field trips.

518 Applied Geophysics I. (3) N

Use of the refraction seismology, reflection seismology and gravity methods to determine the physical properties and structure of the subsurface. Petroleum exploration and engineering applications. Prerequisites: GLG 418†; MAT 291†. Two lectures, 3 hours laboratory. Some field trips during laboratory; possible weekend field trips.

523 Advanced Mineralogy-Crystallography. (3) S; Buseck

Crystallography, principles of X-ray and electron diffraction, defects in crystals, electron microscopy of minerals. Three lectures. Prerequisites: GLG 321† or CHM 441 or equivalent.

524 Advanced Igneous Petrology. (3) N; Sheridan

Theoretical and practical aspects of the genesis of igneous rocks. Study of selected suites. Modern laboratory techniques. Prerequisite: GLG 424†. Two lectures, 3 hours laboratory. Possible weekend field trips.

525 Advanced Metamorphic Petrology. (3) N; Ferry

Theoretical and laboratory study of metamorphic rocks. Processes of contact and regional metamorphism. Advanced methods and instrumentations. Prerequisite: GLG 424†. Two lectures, 3 hours laboratory. Possible weekend field trips.

527 Geology of Carbonates. (3) N; Staff

Physical and chemical analysis of carbonate sediments with emphasis on interpreting depositional and post-depositional history. Prerequisites: GLG 435†, and 481 or 482. Two lectures, 3 hours laboratory. Possible weekend field trips.

528 Clastic Sedimentary Environments. (3) N; Staff

Comparison of modern and ancient sedimentary environments; evaluation of rock sequences and facies models. Research projects. Prerequisites: GLG 424†, 435†. Two lectures, 3 hours laboratory. Weekend field trips.

561 Glacial Geology. (3) N; Péwé

Properties, distribution and origin of glacial deposits, including principles of their stratigraphy and correlation. Environmental geology problems in glaciated regions. Prerequisite: GLG 362†. Two lectures, 3 hours laboratory. Some field trips during laboratory; possible weekend field trips.

562 Quaternary Geology. (3) N; Péwé

Geology of the Quaternary Period in both glaciated and unglaciated areas. Stratigraphy, correlation and environmental application of Quaternary deposits. Special reference to the Southwest. Prerequisite: GLG 362†, or approval of instructor. Two lectures, 3 hours laboratory. Some field trips during laboratory; possible weekend field trips.

583 Phase Equilibria and Geochemical Systems. (3) N;

Holloway

Natural reactions at high temperatures and pressures; silicate, sulfide and oxide equilibria. Prerequisite: GLG 482. (Same as CHM 583).

591 Seminar. (1-3) F, S, SS; Staff

Topics may be selected from the following:

- (a) Igneous, Metamorphic, and Sedimentary Petrology

- (b) Pleistocene Environment
- (c) Advanced 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
- (l) Environmental Geology
- (m) Planetary Geology
- (n) Stratigraphic Micropaleontology

See related courses: ASB 541† Archaeological Pollen Analysis; BOT 490† Paleobotany.

Special Courses: GLG 484, 492, 493, 494, 498, 499, 590, 592, 593, 598, 599, 690, 691, 692, 783, 790, 791, 792, 799. (See pages 32-33.)

Health and Physical Education

PROFESSORS:

KRAHENBUHL (PEBW M-201), MILLER,
ODENKIRK, OSTERHOUDT, PITTMAN,
RICHARDSON, STONE, TOOHEY, WEGNER,
WELLS

ASSOCIATE PROFESSORS:

BRYANT, BURKETT, CORDER, DARST,
DEZELSKY, OLSEN, PACKER, PANGRAZI,
SHIRREFFS

ASSISTANT PROFESSORS:

BAFFI, GRIER, McKEEMAN, PIKE, REDICAN

INSTRUCTOR:

BOOTH

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Health Science (Community Health Emphasis) — Consists of 62-64 semester hours of credit of which 40 must be in the major. Courses HES 100, 340, 360, 361†, 382, 434†, 480†, 482†, and 498 are required. Related fields include ZOL 201, 202†; and one course in chemistry. Thirteen hours of health science electives and 12 hours of related field electives are selected by the student in consultation with a faculty advisor. (See Graduation Requirements, page 39).

Physical Education—Consists of 38 semester hours of credit of which 28 must be in the major field. Courses ZOL 201, 202†, and PED 170, 335†, 340†, 345†, 450† and selected

physical education activity courses 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. Concentration within the program of studies may be directed toward such nonteaching options as exercise science, sports administration, or sport and the media. (See Graduation Requirements, page 39.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Health Science (School Health Emphasis)—Consists of 38 semester hours of credit. Courses HES 100, 340, 360, 361, 382, and 480 are required. Related fields include ZOL 201 and 202†, and one course in chemistry. Twelve hours of health science electives and 8 hours of related field electives are selected by the student in consultation with a faculty advisor. At least 18 semester hours must be in upper division courses.

Physical Education—All majors are required to complete 10 credits of professionally oriented activities as prescribed by the department. Also required are 37 credits in the following theory courses: PED 170, 335†, 340†, 345†, 361†, 376†, 382†, 450†, 480†, 483†, DAN 367 and EED 313. Additionally 300 hours of field experience in sports-related leadership roles must be completed prior to student teaching (150 hours for transfer students). A 2.25 GPA is required for entrance to upper division major courses and SED 433 student teaching. A minimum of 9 credits of student teaching is required, which includes both elementary and secondary school teaching experiences.

Departmental Minor Teaching Field Requirements (Secondary Education)

Health Science—Consists of 24 semester hours of credit. Courses HES 100, 340, 360, 361, 382, and 480 are required. An additional 6 hours of health science electives are to be selected by the student in consultation with a health science advisor.

Coaching of Athletics (Men and Women)—Consists of 32 semester hours of credit. Courses ZOL 201, 202†; PED 335†, 340†,

94 HEALTH AND PHYSICAL EDUCATION

346, 383† and 486† are required; plus 9 hours from PED 291† and electives selected by the student in consultation with an advisor.

Athletic Trainer's Certificate (Men and Women)—Consists of 41 hours of credit. Courses PSY 212; PGS 100; ZOL 201, 202†; HES 100; FON 141; PED 270†, 335†, 340†, 382†, 383†, 485† and PED 486† are required; plus electives selected by the student in consultation with an advisor. Note: Six (6) semester hours of credit or two years' equivalent work of 600 clock hours of internship.

Departmental Graduate Programs

The Department of Health and Physical Education offers programs leading to the Master of Science degree in Physical Education, Master of Education—Secondary Education (Health Science), Master of Education—Secondary Education (Physical Education), Education Specialist (Physical Education), Doctor of Education (Physical Education), and Doctor of Philosophy—Secondary Education (Physical Education). Consult the *Graduate Catalog* for requirements.

HEALTH SCIENCE

HES 100 Personal Health. (3) F, S, SS
Human struggle for achieving harmony between the slowly-changing inner environment and the rapidly-changing outer environment. Some sections may be offered with discussion groups. Consult schedule of classes.

304 Human Sexual and Reproductive Health. (3) S
Issues of curriculum development and program planning. Designed to prepare professionals to instruct younger persons in these areas.

305 Substance Abuse. (3) F
General properties, principles of action, and behavioral effects of psychoactive drugs. Focuses on how substances affect health of humans.

340 School Health. (3) F, S, SS
Basic plan of the school health program; health services, health instruction and school health environment. Analysis of school health problems.

360 Fundamentals of Disease Control. (3) F, S, SS
Epidemiology of communicable and non-communicable diseases. Disease prevention and control. Primarily for prospective health teachers and public health educators.

361 Foundations of Health Science Education. (3) F, S, SS
Analysis of research in various disciplines which contribute to health education. Primarily for prospective health teachers and public health educators. Prerequisites: HES 100 and 382; 6 semester hours in social and behavioral sciences.

382 Introduction to Public Health. (3) F, S, SS
Public and community health is examined including governmental, voluntary, and community agency activities which promote health among populations.

434 Supervised Field Training. (3) F, S
Provides opportunities to observe and work in public and voluntary agencies, either in preparation for beginning-

level employment or for better understanding of interrelationships in community health programs. Prerequisites: 24 credit hours in health science. May be repeated for a total of 6 credits.

470 Environment and Public Health. (3) F, S
Principles of environmental health, involving management of ecosystems and their relationship to public and community health.

480 Methods of Teaching Health. (3) F, S
Techniques and materials for health instruction. Health Education majors and minors only. Prerequisites: HES 100, 360, 361 and 382.

482 Advanced Public Health. (3) F, S
Theory and concepts of public health practice. Program planning, implementation and evaluation applied to a diversity of public health problems. Prerequisites: HES 340 and 480.

501 Contemporary World Health Problems. (3) F, SS
Recent discoveries in medicine, engineering and life sciences, and their application to personal and community health. Malnutrition, venereal diseases, tuberculosis, malaria, leprosy, parasitological infestations, radiation, environmental pollution.

502 Health Problems of the Southwest. (3) S
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.

503 Field Experience in Community Health. (1-6) N
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 a total of 6 credits.

504 Education for Human Sexuality. (3) F
Current concepts of human sexuality are explored and applied to curriculum development and program planning in health education.

505 Drug Dependency: Perspectives and Approaches. (3) S
Classification of mood-modifying substances in terms of effects. Motivational and social forces contributing to the dynamics of the problem; control and treatment.

554 Sociological Aspects of Health Education. (3) S
Medicare, Medicaid, World Health Organization, Peace Corps, the U.S. Public Health Service, the inner city and health, and community health services.

560 Curriculum Construction in Health Education. (3) N
Problems of curriculum construction with respect to acquisition of materials, establishment of basic curriculum philosophies, application of education principles, and sequence of course content.

Special Courses: HES 484, 494, 498, 499, 590, 591, 592, 593, 594, 598, 599. (See pages 32-33.)

Students who complete satisfactorily selected HES 494 courses or HES 470 are eligible to qualify for a certificate of accomplishment from the Center for Disease Control, U.S. Department of Health and Human Services.

PHYSICAL EDUCATION

A \$5.00 towel and locker fee is required each semester by students using towel and locker facilities for physical education classes and intramural activities.

Physical Education Activity classes (PED 105, 205, 305, 310) may not be taken for audit.

PED 105 Physical Education Activity. (1) F, S, SS
Beginning instruction in adapted physical activities and a variety of sports: golf, ice skating, scuba, karate, judo, handball, equitation, tennis, swimming, weight training, gymnastics, and other activities. Three hours a week. May be repeated for credit.

110 Individual and Team Sports. (1-2) F, S
Skills, strategies and knowledge of required physical activities for prospective physical education teachers. One lecture, one laboratory.

170 Introduction to Physical Education. (3) F, S, SS
Orientation to and exploration of the field of physical education, to be taken in the freshman year. Required of students majoring in physical education.

175 Occupational and Physical Therapy. (2) S
Backgrounds, purposes and functions of the professions of physical therapy and occupational therapy; their relationships to health professions and community agencies.

205 Physical Education Activity. (1) F, S, SS
Intermediate levels. Continuation of PED 105. Three hours a week. May be repeated for credit.

270 Instructorship in Standard First Aid. (1) F, S
For individuals seeking the Standard First Aid Certificate, leading to qualification as a first aid instructor. Prerequisite: must be 18 years of age.

290 Sports Officiating. (3) S
Rules and mechanics of officiating used in football, basketball, baseball and track and field.

291 Theory of Coaching. (2) F, S
Theory of coaching competitive sports. Each class meets four hours per week. Physical education majors and coaching minors, or approval of area chair.

305 Physical Education Activity. (1) F, S
Advanced levels. Continuation of PED 205. Includes Red Cross Senior Life Saving, Red Cross Water Safety Instructorship (Prerequisite: Current Senior Red Cross Life Saving Certificate), and other aquatic activities. Three hours a week. May be repeated for credit.

310 Collegiate Sports. (1) F, S
Credit may be given for participation in competitive sports. For men and women. May be repeated for a total of 4 credits. Time arranged. Y grade only.

335 Biomechanics. (3) F, S, SS
Kinematics and dynamics applied to human movement. Development of biomechanical concepts for application in analysis and evaluation of neuromuscular skills. Prerequisite: ZOL 201.

340 Physiology of Exercise. (3) F, S, SS
Effects of the various types of exercise upon body structure and function. Prerequisite: ZOL 202†.

345 Motor Development and Learning. (3) F, S, SS
Development of perceptual-motor behavior from infancy through adulthood. Acquisition of neuromuscular skills is examined with references to biological, psychological, and social determinants. Prerequisites: ZOL 201 and 202†.

346 Psychology of Coaching. (3) S, SS
Principles of learning applied to coaching sports. Psychological and social problems of coaching.

361 Physical Education in the Secondary School. (3) F, S, SS
Current trends and theories, such as elective programs, coed classes, legal issues, contract teaching, curriculum and administration.

376 Physical Education for the Elementary School. (3) F, S, SS
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.

382 Physical Education for the Atypical Student. (3) F, S
Handicapping conditions found among students and adaptation of exercises and activities to individual needs. Open to all students. Prerequisite: PED 335† or instructor's approval.

383 Techniques of Athletic Training. (3) F
Screening and conditioning of athletes, prevention, care and treatment of athletic injuries; includes techniques of applying supportive materials and use of therapeutic aids. Prerequisites: ZOL 201 and 202†.

384 Physical Activities for Handicapped Students. (3) S, SS
Adapting physical activities for the physically and mentally handicapped student, grades K-12. Prerequisite: PED 382 or instructor's approval.

450 History and Philosophy in Physical Education. (3) F, S, SS
Historical and philosophical heritage of physical education from early Greek society to present-day physical education, emphasizing developments in the United States.

480 Methods of Teaching Physical Education. (2,2) F, S
Methods of instruction, organization and presentation of appropriate content in elementary and secondary physical education. Four lectures.

483 Evaluation in Physical Education. (3) F, S, SS
Analysis and construction of tests. Analysis of data and interpretation of measurement in physical education programs.

485 Advanced Techniques of Athletic Training. (3) S
Problems in medical aspects of athletic training, including injury examination techniques, treatment modalities and techniques, therapeutic exercise, rehabilitation of athletic injuries. Budgeting and secondary school administration of athletic training. Prerequisite: PED 383.

486 Coaching/Athletic Training Internship. (1-6) F, S
Relationship of theory of coaching athletics and/or athletic training techniques to practical application of coaching and/or athletic training techniques. Prerequisite: approval by discipline chair. Y grade only.

501 Research Statistics. (3) S
Statistical procedures; sampling techniques; hypothesis testing, and experimental designs as they relate to studies reported in research publications. To be taken prior to or concurrent with PED 500.

505 Research Laboratory. (3) F, S
Advanced research techniques in use and calibration of laboratory equipment utilized in cinematographic analysis, cardiorespiratory testing and motor learning experimentation.

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515 Facilities and Equipment. (3) F, S

Principles, standards, personnel, designs, and equipment utilized in the planning, construction and maintenance of indoor/outdoor facilities.

520 Organization and Administration of Athletics. (3) F, S, SS

Finance, budget, promotion, personnel, game management and public relations; problems of interscholastic and intercollegiate athletics.

525 Theory of Administration. (3) F, S, SS

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.

535 Advanced Biomechanics. (3) S, SS

Statics, dynamics, strength of materials and fluid dynamics as applied to human movement. Current research in biomechanics and techniques of research.

540 Physiological Bases for Physical Activity. (3) F, S, SS

Immediate and long-term adaptations to exercise with special reference to training and the role of exercise in cardio-vascular health.

542 Environmental Aspects of Human Performance. (3) S

Mechanisms of physiological response of healthy human beings to desert, arctic, mountain and undersea environments, with emphasis on the effect of environmental stresses upon exercise performance.

545 Motor Learning and Development. (3) F, S, SS

Theories and principles underlying motor learning, performance, and development. Role of visual and kinesthetic perception, and general and specific abilities in motor learning and performance.

546 Psychology of Coaching. (3) F, S, SS

Athletes' behavior in competitive sports, with emphasis on personality and motivational techniques.

547 Improving Performance in Sport Skills. (3) F, SS

Factors in successful motor performance in skills used in individual, dual, and team sports.

550 Historical Bases of Physical Education. (3) F, S, SS

Golden Age of Greece, Renaissance and modern Europe. Cultural, economic and educational forces which influenced the development of physical education, dance, and athletics in the United States.

552 Philosophical Bases of Physical Education. (3) F, S, SS

Idealism, realism, naturalism, experimentalism, and existentialism as they relate to the development of physical education programs.

555 Sport and the American Society. (3) F, S, SS

Impact of sports upon the American culture, with focus on competition, economics, myths, minorities, and the Olympic syndrome.

572 Trends and Issues in Physical Education. (3) F, S, SS

Literature, research, and practices in contemporary physical education, including finances, Title IX, teaching and coaching philosophies, school organization, and non-teaching physical education programs.

573 Curriculum Construction in Physical Education. (3) F, S, SS

Application of principles, practices, and functional philo-

sophies of curriculum making in physical education.

Prerequisite: major in physical education or teaching experience.

574 Behavioral Analysis in Sport and Physical Education. (3) SS, N

The application of behavioral principles, practices, philosophies and research to teaching physical education and coaching athletics.

576 Physical Education for Elementary School Children. (3) S, SS

Current practices and research pertaining to elementary school physical education programs.

577 Movement Experiences for Pre-School Children. (3) SS, N

Movement activities for pre-schoolers based on the needs and characteristics of young children.

582 Adapted Physical Education. (3) F, S, SS

Contemporary adapted, developmental, remedial and corrective physical education programs; understanding of principles, problems and recent developments in this area.

583 Principles of Evaluation in Physical Education. (3) F, S, SS

Examination of literature and research pertaining to principles for evaluating performances; statistical procedures necessary to the implementation of grading plans.

Special Courses: PED 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 680, 683, 684, 690, 691, 692, 780, 783, 784, 790, 791, 792, 799. (See pages 32-33.)

History

PROFESSORS:

KARNES (SS 204), BARLOW, BURG, DANNENFELDT, GIFFIN, HUBBARD, KLEINFELD, MULHOLLAN, PAULSEN, TAMBS, WILSON, YOUNG

ASSOCIATE PROFESSORS:

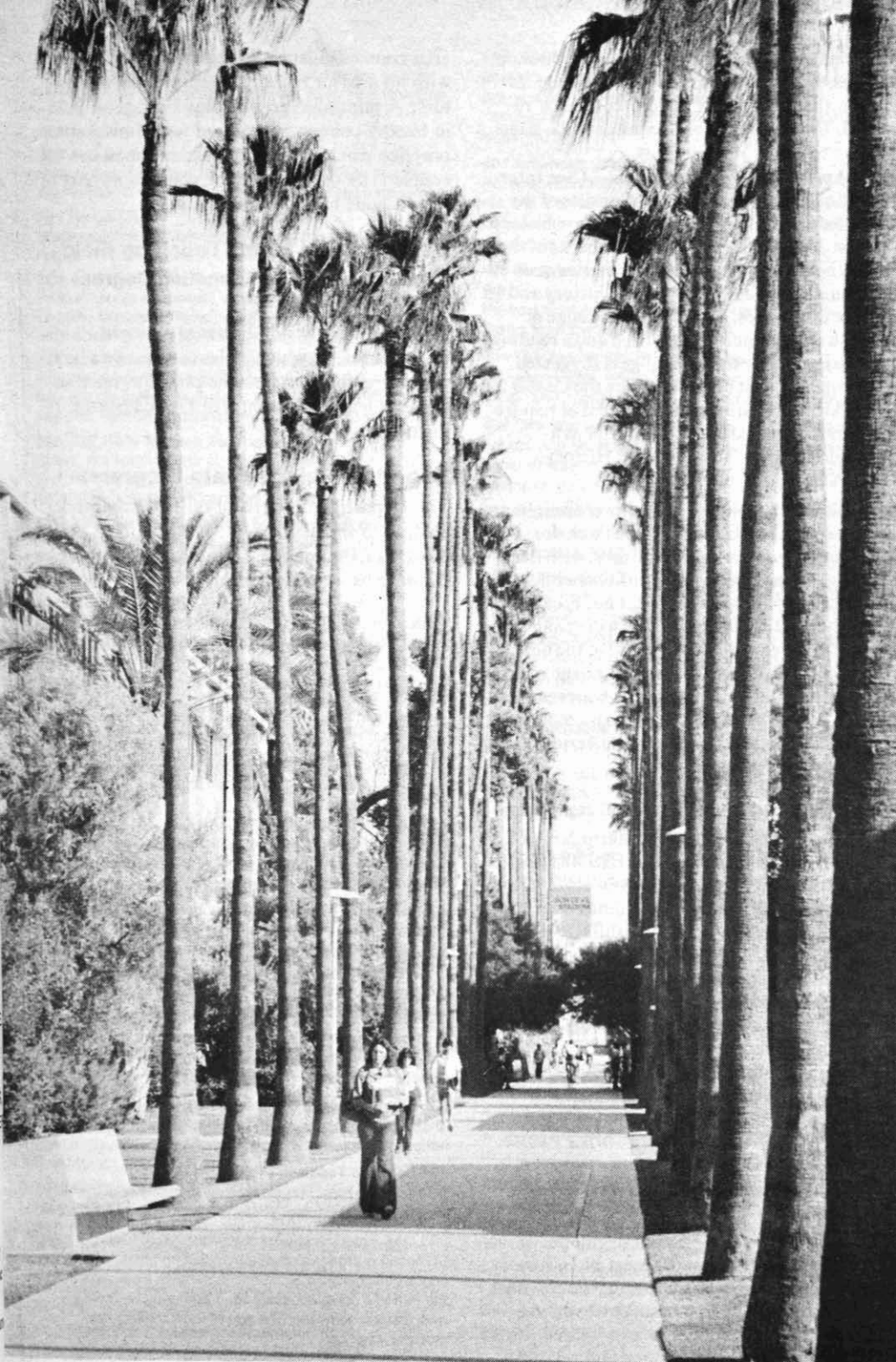
ADELSON, FOSTER, FULLINWIDER, KAHN, KEARNEY, LOEWENBERG, LUCKINGHAM, MacKINNON, PHILLIPS, R. D. SMITH, STOWE, TRENNERT, WARNICKE, WOOTTEN

ASSISTANT PROFESSORS:

BATALDEN, CARROLL, DIBBERN, ROSALES, ROTHSCHILD, L. C. SMITH, TILLMAN, WEINER

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 18 hours in history courses and six hours



in the related fields must be in upper division courses. A minimum grade point average of 2.25 in the 30 hours of history courses is required. (See Graduation Requirements, page 39.)

Latin American Studies Emphasis —(See Interdisciplinary Studies, page 54.) Consists of the Bachelor of Arts degree requirements in history. At least 30 upper division semester hours of the total program must be in Latin American content courses, including 15 hours in history and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a bachelor's degree with a major in History Latin American Studies Emphasis.

Asian Studies Emphasis—(See Interdisciplinary Studies, page 52.) Consists of the Bachelor of Arts degree requirements in history, with the language requirement being fulfilled with an Asian language. Thirty semester hours of the total degree program must consist of Asian area courses selected with the approval of the departmental advisor. Lower division language courses may not be counted within the 30-hour requirement. Completion of this program is recognized by a Bachelor of Arts degree with a major in History—Asian Studies Emphasis.

Bachelor of Science Degree Curriculum

History—Consists of 60 semester hours of credit, of which 42 (including HIS 481 and 482) must be in history and 18 in closely related fields and quantitative studies, as approved by the advisor in consultation with the student. HIS 481 and 482 are required for all degree candidates. At least 27 hours in history courses and nine hours in the related fields must be in upper division courses. A minimum grade point average of 2.25 in the 42 hours of history courses is required. (See Graduation Requirements, page 39.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

History—Consists of 42 semester hours of credit, of which at least 30 must be in history courses. At least 18 of the history hours must be in upper division courses. At least three hours of credit must be taken in United States history. The remaining history and related

area courses must be selected in consultation with an advisor from the Department of History. A minimum grade point average of 2.25 in history courses is required for admission to practice teaching and for graduation. The course HIS 480 may *not* be counted as part of the 42-hour major requirement.

Departmental Minor Teaching Field 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 courses. The program must include at least three hours in United States 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.

HISTORY

Courses listed in pairs or triplicate may be taken in any order.

HIS 100, 101, 102 Western Civilization. (3, 3, 3) F, S, SS
Traces origin and development of Western man and his institutions. HIS 100, Ancient World through the Middle Ages; HIS 101, Renaissance and Reformation through Age of Enlightenment; HIS 102, French Revolution to the present.

103, 104 The United States. (3, 3) F, S, SS
Growth of the Republic from colonial times with the first semester covering through the Civil War period and the second continuing to the present day.

105 China: Literature and Revolution. (3) A; MacKinnon, Tillman
Novels, short stories, poems, etc. will be used to explore the social history and revolutions of modern China, with emphasis on 1915 to the present.

106 The People's Republic of China. (3) A; MacKinnon
Analysis of major political, social, economic, and intellectual trends in China since the founding of the People's Republic in 1949.

200 Latin American Civilizations. (3) A
The culture, economics, and politics of Latin American nations. *Not open to history majors.*

294 Selected Topics in History. (3) N
A full description of topics for any semester is available in the History Department office. May be repeated for credit.

303, 304 American Cultural History. (3, 3) F, S, SS
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.

- 305, 306 Asian Civilizations.** (3,3) F, S, SS
The civilizations of China, Japan, and India. The second semester may also include Southeast Asia. First semester, to mid-17th century; second semester, mid-17th century to present.
- 320 Ancient Greece.** (3) A
History and civilization of the Greek world from the Bronze Age to the Roman conquest of the Hellenistic kingdoms.
- 321 Rome.** (3) A
History and civilization of Rome from the beginning of the Republic to the end of the Empire.
- 322, 323 The Middle Ages.** (3, 3) A
Political, socio-economic, and cultural developments of Western Europe. First semester, Early Middle Ages; second semester, High Middle Ages.
- 324, 325 Renaissance and Reformation.** (3, 3) A
324: Antecedents and development of the Renaissance in Italy and its spread to the rest of Europe. 325: The Protestant and Catholic Reformations in the 16th century.
- 326, 327 Early Modern Europe.** (3, 3) A
Social, economic, cultural, and political changes in 17th and 18th century Europe. First semester, 17th century; second semester, 18th century.
- 329, 330 Nineteenth Century Europe.** (3, 3) A
Political, social, economic, and intellectual currents in Europe from Napoleon through World War I. First semester, 1815-1866; second semester, 1866-1918.
- 331, 332 20th Century Europe.** (3, 3) A
Europe in its world setting since World War I, emphasizing major political and social issues. First semester, 1914-1945; second semester, 1945 to the present.
- 339 Diplomatic History of Modern Europe.** (3) N
From the Congress of Vienna to the present.
- 340, 341 Economic History of Modern Europe.** (3, 3) N
Impact of industrialism upon the political, social, and cultural life of Europe. First semester, Renaissance to the 19th century; second semester, 19th and 20th centuries.
- 351, 352 England.** (3, 3) F, S
Political, economic, and social development of the English people. First semester, to the 17th century; second semester, 17th century to the present.
- 362 The American Indian.** (3) F
History of the American Indian with emphasis on the government's Indian policy and the impact of the white man on tribal culture.
- 364 The Black American Experience.** (3) F, S
The Afro-American in American history, thought and culture, emphasizing those aspects that were directly influenced by their presence.
- 367, 368 The West in American History.** (3, 3) A
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, the development of the frontier thesis to 1890, emphasizing Arizona and the Southwest.
- 369 The West in the 20th Century.** (3) N
Role of the western states in American history since 1890 with emphasis on politics, the environment, industry and labor, and the changing position of ethnic minorities.
- 370 Women in United States History.** (3) A
Examination of lives of prominent American women from colonial times to the present.
- 380 History of the Mexican-American.** (3) A
Role of the Mexican-American in U. S. history.
- 383, 384 Latin America.** (3, 3) A
First semester, ancient civilization, explorers and conquerors, and colonial institutions; second semester, nationalistic development of the independent republics since 1825.
- 401 American Colonial History.** (3) A; Burg
Political, economic, social, and cultural history of the colonial era. Concentrates on English colonies, with some consideration of Spanish, French, and other colonial regions in North America.
- 403 Early National Period in American History.** (3) A; Burg
Political, social, and economic development of the United States from the Revolution to 1828.
- 404 The Jacksonian Era.** (3) A; Loewenberg
American ideals, with emphasis on equality in the political, social, and economic life of the nation, 1828-1850.
- 406 Civil War and Reconstruction.** (3) A; Hubbard
Causes and development of the war; political, constitutional, and social issues of Reconstruction, and their effects on post-war America.
- 407 Populism and Progressivism.** (3) A; Phillips
Political, social, economic, and intellectual trends in the United States, 1877-1918.
- 409, 410 Recent American History.** (3, 3) A; Kearney, Smith
First semester, 1913-1932, Wilsonian diplomacy and the First World War, the 1920s, the origins of the Great Depression, Hoover administration; second semester, 1932-1945, the New Deal, society during the Depression, Second World War.
- 411 Contemporary America.** (3) F, S; Smith, Foster
The United States from 1945 to the present.
- 413 Origins of the American Economy.** (3) N; Foster
American economic growth from the colonial period to 1900; trade and commerce, problems of slavery and agriculture, industrial development, and the government's role in the economic sector.
- 414 The 20th Century American Economy.** (3) N; Foster
America as a world economic power from 1900 to the present; business changes and cycles, government regulation, agriculture, labor, and the problems of a mature economy.
- 415, 416 American Diplomatic History.** (3, 3) A; Paulsen, Mulhollan, Wilson
American relations with foreign powers. First semester, 1776-1898; second semester, 1898 to the present.
- 417, 418 Constitutional History of the United States.** (3, 3) N; Paulsen
Origin and development of the American constitutional system. First semester, colonial origins through Reconstruction; second semester, Reconstruction to the present.
- 419, 420 American Urban History.** (3, 3) A; Luckingham
The history of the city in American life. First semester, colonial times to the late 19th century; second semester, 19th century to the present.
- 421 History of American Labor.** (3) A; Foster
Labor union history, ideological origins of modern labor law, and agricultural labor. Emphasis on labor problems and development in the 20th century.

100 HISTORY

- 422 Social History of American Women.** (3) A; Rothschild
Women's role, status, and achievements in America. Changes in family patterns and effects of immigration, industrialization, and urbanization.
- 423 Recent American Intellectual History.** (3) A; Fullinwider
Major movements in 20th century science, religion, and philosophy.
- 424 The Hispanic Southwest.** (3) N; Stowe
Development of the Southwest in the Spanish and Mexican periods to 1848.
- 425 The American Southwest.** (3) N; Trennert
Development of the Southwest from 1848 to the present.
- 427 A History of Labor Law and Philosophy.** (3) N
Collective bargaining practices around the world, with a review of the development and influence of American labor law.
- 428 Arizona.** (3) F, S; Staff
Emergence of the state from early times to the present.
- 430 20th Century Chicano History.** (3) A; Rosales
Historical development of the Chicano community in the 20th century.
- 431 The French Revolution and the Napoleonic Era.** (3) N
Conditions in France before 1789, the Revolutionary decade from 1789 to 1799, the organization of France under Napoleon and the impact of changes in France on European society.
- 433 Modern France.** (3) A
France since 1870.
- 434 Hitler: Man and Legend.** (3) A; Kleinfeld
A biographical approach to the German Third Reich emphasizing nature of Nazi regime, World War II, and historiography.
- 435 Modern Germany.** (3) A; Kleinfeld
Germany since 1840.
- 437, 438 Eastern Europe and the Balkans.** (3,3) A; Batalden
Peoples and countries of eastern and southeastern Europe in the 19th and 20th centuries. First semester, 1800-1914, emphasizing the Hapsburg and Ottoman Empires; second semester, 1914 to the present, emphasizing the successor states.
- 439 The Modern Middle East.** (3) N; Adelson
Impact of the Western world upon Middle Eastern governments, religion, and society in the 19th and 20th centuries; problems of modernization and the role of the Middle East in world affairs.
- 441 Imperial Russia.** (3) A; Giffin, Batalden
Development of Russian political, economic, social, religious, and intellectual institutions and traditions from the end of the 17th century to the collapse of the tsarist autocracy in 1917.
- 442 The Soviet Union.** (3) A; Giffin
An examination of Soviet politics, economic development, and foreign relations from the 1917 Revolution to the present.
- 443 Russia and the United States.** (3) A; Giffin
Official and unofficial relations between Russia and the U.S., late 18th century to the present. Emphasizes period following the Bolshevik Revolution.
- 445 Tudor England.** (3) A; Warnicke
Political, social, economic, and cultural developments in 16th century England.
- 446 Stuart England.** (3) A; Warnicke
Political, social, economic, and cultural developments in 17th century England.
- 447 Georgian England.** (3) N; Barlow
Major social, economic, political, and intellectual trends in 18th and early 19th century Britain.
- 449 Modern Britain.** (3) A; Adelson
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.
- 450 British Constitutional History.** (3) A; Warnicke
Historical development of the constitutional system of Great Britain from the Middle Ages to the present, emphasizing the growth of democracy.
- 451 The British Empire.** (3) A; Adelson
British imperialism and colonialism in Africa, the Americas, Asia, and the South Pacific.
- 454, 455 Intellectual History of Modern Europe.** (3,3) A; Barlow
Major developments in European thought from the scientific revolution to the present. HIS 454, Copernicus through Bentham; HIS 455, Karl Marx to the present.
- 456, 457 History of Spain.** (3,3) N; Stowe, Tambs
Cultural, economic, political, and social development of Spain. First semester, earliest days to 1700. Second semester, 1700 to the present.
- 458 Age of Conquest: Latin America.** (3) F; Stowe
Establishment of Spanish and Portuguese empires in America. Iberian and pre-Conquest backgrounds with emphasis on the Conquest and its impact through the early 17th century.
- 459 Change and Reform: Colonial Latin America.** (3) S; Stowe
Examination of political, economic, and social institutions. Emphasis on 17th century changes and the 18th century reforms leading to independence movements.
- 460, 461 Spanish South America.** (3,3) N; Tambs
Political, economic, and social development of the Spanish-speaking nations of South America since independence. First semester, the 19th century; second semester, 20th century developments.
- 463 Intellectual and Cultural History of Latin America.** (3) N; Tambs
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.
- 464 The United States and Latin America.** (3) A; Karnes
The Latin American struggle for diplomatic recognition, attempts at political union, participation in international organizations since 1810, and relations between the United States and Latin America.
- 466, 467 Mexico.** (3,3) A; Rosales, Stowe
Political, economic, social, and cultural developments. First semester, earliest times to 1810; second semester, 1810 to the present.
- 468 Brazil.** (3) N; Tambs
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.
- 470 Chinese Cultural History.** (3) A; Tillman
Chinese thought and culture from Confucius to the present.

471, 472 Diplomatic History of East Asia. (3, 3) N; Kahn
Foreign relations of China, Japan, and Korea. First semester, Opium War to 1905; second semester, 1905 to the present.

473, 474 China. (3, 3) A; Tillman, MacKinnon
Political, economic, social, and cultural history of the Chinese people. First semester, early times to the late 17th century; second semester, mid-17th century to the present.

476 Modern Southeast Asia. (3) N; MacKinnon
Imperialism and revolution in 19th and 20th century Southeast Asia.

477, 478 Japan. (3, 3) A; Kahn
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.

479 The Chinese Communist Movement. (3) N; MacKinnon
Analysis of the communist movement in 20th century China, with emphasis on its historical setting.

480 Methods of Teaching History. (3) F; Phillips
Methods in instruction, organization, and presentation of the subject matter of history and closely allied fields.

481 Quantification in History. (3) A; Weiner
Uses of statistical and quantitative techniques in the study of historical problems in political analysis, new economic theory, demography, and social history.

482 Historical Statistics. (3) A; Dibbern, Foster, Weiner
Statistical routines and computer programs applicable to historical quantification.

512 European Historiography. (3) A; Barlow
Methods and theories of writers of European history.

513 American Historiography. (3) A; Loewenberg
Methods and theories of writers of United States history.

514 Latin American Historiography. (3) N; Tams
Methods and theories of writers of Latin American history.

520 Historical Editing and Publishing Procedures I. (2) F
Introduction to editing of scholarly journals and books. Covers manuscript evaluation and preparation, copy editing, proofreading, and related topics.

521 Historical Editing and Publishing Procedures II. (2) S
Advanced work in copy editing, substantive editing, and manuscript evaluation. Includes treatment of author-editor relations and preparation of indexes. Prerequisite: HIS 520.

522 Issues in Historical Editing. (2) F
Survey of journal and textbook publishing, including publishing law, financial aspects of publishing, book design, printing technology, and related topics. Prerequisites: HIS 520, 521 and 584 (Editing Internship).

580 Practicum. (3) A; Staff
Methods and subject matter instruction in history. The functions and responsibilities of college teaching. Open only to graduate assistants.

581 Seminar. (3) N; Staff
May be repeated for credit. Topics may be selected from the following areas:

- (a) United States History
- (b) European History
- (c) English History

(d) Latin American History

(e) East Asian History

Special Courses: HIS 294, 298, 484, 492, 493, 494, 497, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599, 790, 792, 799. (See pages 32-33.)

Home Economics

PROFESSORS:

_____ (HEC 106), HOOVER, MONTS,
MORGAN

ASSOCIATE PROFESSORS:

BAKER, STANGE, STREUFERT

ASSISTANT PROFESSORS:

CREIGHTON, FILSINGER, HARTWIGSEN,
HUNTER, LAMKE, LEWIS, MONTE, MORALES,
PETERS, ROOSA

Departmental Major Requirements

The Department of Home Economics awards the Bachelor of Arts or Bachelor of Science degree upon successful completion of a four-year curriculum of 126 semester hours as prescribed on page 48 under the College of Liberal Arts. Courses HEC 230 and 430† are required. Six hours of the home economics courses listed on page 50 and not within the major area of specialization may be applied to fulfill the Liberal Arts General Studies requirements.

For either the B.A. or B.S. degree, students must select one of the following areas of concentration:

Family Studies/Child Development

Human Nutrition-Dietetics with an option in:

- 1) Nutritional Science or 2) Dietetics (general, management, clinical, or community)

General Home Economics

Home Economics Education

Home Economics in Business with an option in:

- 1) Decorative Arts, 2) Food Service Management, 3) Consumer Service in Foods, or 4) Textiles and Clothing

When field experience is included in the curriculum to complete requirements for graduation, students should register for HEC 451 Field Experience, identifying it with the area of specialization.

102 HOME ECONOMICS

American Dietetic Association requirements consist of 68 hours of approved courses leading to an internship. See chair of department for further information.

Bachelor of Arts Degree Curriculum

Home Economics—Consists of 45 semester hours of credit of which 30 are in home economics and 15 in related fields; 20 semester hours of credit must be in home economics upper division. The specific courses will be determined by the student in consultation with the advisor, depending on the area of specialization. (See Graduation Requirements, page 39.)

Bachelor of Science Degree Curriculum

Home Economics—Consists of 50 semester hours of credit of which at least 20 must be in upper division home economics courses. The specific courses will be determined by the student in consultation with the advisor, depending on the area of specialization. (See Graduation Requirements, page 39.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree

Home Economics—Consists of 36 semester hours of credit in home economics. Major courses required are: TXC 123; FON 141, 142; CDE 232†; PGS 100; SOC 101; CDE 337†; FAS 331†, 357†; HEC 451†; HEE 461†, 480, 481†. Select two from HEE 153; DEH 272, 373†. General Studies courses required: DEH 172, FAS 354, CHM 101 or 113†, a mathematics course, an American history course, and a course in Arizona Constitution and American national government. Remaining credits to meet major requirements are selected in consultation with major advisor.

Center for Family Studies

The Center for Family Studies is an educational, research and service agency of the University within the College of Liberal Arts in the Department of Home Economics. The Child Development Laboratory is affiliated with the Center. The main purpose of the Center is to carry out research programs which foster the understanding of family life

from an interdisciplinary point of view. Policies and programs of the Center are guided by an interdepartmental advisory committee.

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

CDE 232 Child Development. (3) F, S

Development from conception through later childhood. Significance of family membership. Recognition of individuality within the universal pattern of human development. Guided observations. Prerequisites: PGS 100, SOC 101.

337 Guided Interaction with Children. (3) F, S

Discussion and application of methods for communicating with children and for guiding young children in cognitive and social learning experiences. Participation in the Child Development Laboratory. Prerequisite: CDE 232 or equivalent. Two lectures, 3 hours laboratory.

430 Family as a Learning Environment. (3) F, S

Family interaction which enhances the development and growth of infants or toddlers. Participation with child-parent pairs. Prerequisite: CDE 337† or equivalent. Lecture and laboratory. May repeat for a total of 6 credits.

434 Organization and Administration of Preschools. (3) S

Planning, operation and evaluation of programs for young children as related to national regulations, needs of the child, family and community. Investigation of exemplary programs. Prerequisite: CDE 337† or approval of instructor. May include field trips.

437 Analysis of Child Behavior. (3-6) S

Developmental problems during childhood and methods for changing children's behavior based upon observation and behavior analysis. Three lectures; may include 3 hours laboratory per credit, up to 3. Prerequisites: CDE 337† or equivalent, plus 6 semester hours of psychology.

531 Advanced Child Development. (3) S

Major developmental theories, related research, and their application to family interaction. Prerequisite: CDE 232†, CED 522, or approval of instructor.

532 Behavior of Young Children. (3) F

Focus on developmental and behavioral problems of early childhood. Application of research-based principles to child guidance. Prerequisite: 6 semester hours in upper-division child development courses or approval of instructor.

DECORATIVE ARTS

DEH 171 Introduction to Decorative Arts: Cultural Influences. (3) F, S

Focus on how diverse cultures have expressed themselves through the decorative arts. May include field trips.

172 Introduction to Decorative Arts: Basic Design. (3) F, S

Elements and principles of art as they relate to design problems in our physical environment. Majors only or approval of instructor. May include field trips. 2 lectures, 2 hours studio.

271 Creative Textiles. (3) F

Ancient textile techniques and their relationship to today's life style. Creative experiences in a variety of techniques. May include field trips. One lecture, 4 hours studio.

272 Basic Issues in Housing. (3) F, S

The study of housing; human needs, effects of the housing environment upon humans; legal and financial trends.

371 Decorative Textiles. (3) S

Investigation of the fabrication and esthetic qualities of textiles. Cultural and historical expression of design as related to interiors. Prerequisite: DEH 171 or approval of instructor. May include field trips.

373 Interior Furnishings. (3) F, S

Evaluation of furnishings designed for the home in a functional, economic and esthetic framework. Prerequisite: DEH 172 or approval of instructor. TXC 223 is recommended. May include field trips.

472 Housing and Society. (3) S

Family housing as affected by legislation with application to contemporary housing.

474 History of Interior Furnishings I. (3) F

The design of furnishings as an expression of culture from antiquity to the 20th century.

475 History of Interior Furnishings II. (3) S

Design of furnishings as an expression of culture of the American periods and the 20th century. Prerequisite: DEH 474 or approval of instructor.

476 Socio-Psychological Aspects of Housing. (3) F

Social and psychological factors affecting individual and family housing decision making. Prerequisite: DEH 272.

477 Advanced Interior Furnishings. (3) F, S

Emphasis on furnishings and designing special activity areas in residential environments. Prerequisites: DEH 373, 476, TXC 223. May include field trips.

572 Current Housing Issues. (3) F, S

Focuses on selected current housing issues, their relationship to and effect on the family.

FAMILY STUDIES**FAS 330 Personal Growth in Human Relationships.** (3) F, S

Personal development and behavior as related to competency in interpersonal relationships within the family. Processes of family interaction. Prerequisites: SOC 101 and PGS 100, or equivalents.

331 Family Relationships. (3) F, S

Issues, challenges and opportunities relating to present day family living. Factors influencing inter-relations within the family. Prerequisite: course in psychology or sociology.

332 Human Sexuality. (3) F, S

Relationship of sexuality to family life and to major societal issues. Emphasis on developing healthy, positive, and responsive ways of integrating sexual and other aspects of human living. Prerequisite: PGS 100.

354 Consumer Economics: Issues. (3) F, S

Relationship of the consumer to the economy as a determinant of the family pattern of living. Current consumer problems and sources of protection.

357 Management in the Family. (3) F, S

Management as a means to realization of individual and family values and goals; creation, allocation and use of resources. Focus on decision making. Prerequisites: SOC 101 and PGS 100 or equivalent.

430 Parent-Child Relationships. (3) S

Needs of parents and children and the dynamics of parent-child interaction, centering on the years in the family

life cycle through the children's elementary school experiences. Prerequisite: CDE 232† or FAS 330† or 331†.

431 Parent-Adolescent Relationships. (3) F

Dynamics of the relationships between parents and adolescents. Developmental characteristics of adolescence and the corresponding adult stage. Prerequisites: CDE 232†, FAS 331†.

432 Family Development. (3) F

Normative changes in families over time, from formation until dissolution. Emphasis on the marital subsystem in middle and later years. Prerequisites: CDE 232† and FAS 331†, or approval of instructor.

435 Advanced Family Relationships. (3) F

Recent research, issues and trends relating to family interaction. Influence of family composition, physical environment, family patterns and values on family dynamics. Prerequisite: FAS 331†.

436 Conceptual Frameworks in Family Studies. (3) S

Significant organizing approaches to study of the family with particular focus on the eco-system, interactional and developmental frameworks. Application to diverse individual and family situations. Prerequisites: FAS 331†, 357 or 454†, and CDE 232†.

440 Fundamentals of Counseling. (3) S

Counseling in relation to family interaction; attention to communication skills relevant to a variety of helping relationships.

454 Consumer Economics: Family Finance. (3) S

Major family income and expenditure alternatives in attainment of family goals.

536 Family Crises and Resources. (3) F

Special problems encountered in the family. Individual and community resources for approaching them. Prerequisites: FAS 330†, CED 522 or equivalent.

537 Individual Development in the Family Milieu. (3) S

The family as a framework for human development. Reciprocal influence between individual and family development. Prerequisites: CDE 232†, FAS 331†.

538 Approaches to Marriage and Family Counseling. (3) N

Methods currently used in marriage and family counseling and consideration of theoretical bases underlying the methods. Prerequisite: approval of instructor.

551 Family Decision-Making. (3) F

Theory and research focusing on centrality of decision to management in family settings. Ecological systems approach to family decision issues. Prerequisite: FAS 357† or approval of instructor.

554 Family Economics. (3) N

Analysis of public policy affecting family economic behavior with respect to divorce, taxation, credit, population, and other issues. Prerequisite: FAS 354 or ECN 201 or ECN 500†.

591 Seminar. (3) N

May be repeated for credit. Topics may be selected from the following areas: a) Consumer Education; b) Cross-Cultural Management; c) Issues of Scarce Resources; d) Values.

104 HOME ECONOMICS

FOOD AND NUTRITION

FON 141 Human Nutrition. (3) F, S

Basic principles of human nutrition as they relate to health and well-being of individuals and families. Emphasis on the nutrients and factors which affect their utilization in the human body.

142 Applied Food Principles. (3) F, S

Applied scientific principles of food preparation and production. Two lectures, 3 hours laboratory.

341 Food: Management and the Consumer. (3) S

Factors affecting the food supply, consumer protection, buying and management of human and material resources. Laboratory: Planning, organizing, preparing and serving food; management of time, money and energy; consideration of nutrient needs, food quality and consumer acceptability. Prerequisites: FON 141, 142, HEE 153. Two lectures, 3 hours laboratory.

343 Food Service Systems Procurement. (3) F

Food purchasing for institutions: cost factors, food laws, quality standards, and basic manufacturing processes. Prerequisite: FON 341† or approval of instructor. Two lectures, 3 hours laboratory. Field trips may be taken.

344 Food Service Systems Management. (3) S

Organization, administration, and management of food service in hospitals and other institutions. Prerequisite: FON 343† or approval of instructor. Two lectures, 3 hours laboratory. Field trips may be included.

440 Advanced Human Nutrition I. (3) F

Metabolic reactions and interrelationships of vitamins, minerals, and water. Prerequisites: FON 141, ZOL 202†, and CHM 361†. CHM 332† recommended.

441 Advanced Human Nutrition II. (3) S

Metabolic reactions and interrelationships of carbohydrate, lipid, and protein. Prerequisites: FON 141, ZOL 202†, and CHM 332†. CHM 361† recommended.

442 Experimental Foods. (4) F

Food product development techniques, food evaluation and testing, and investigation of current research into food composition. Prerequisites: FON 142, CHM 231†. Two lectures, 6 hours laboratory.

444 Diet Therapy. (3) S

Principles of nutritional support for prevention and treatment of disease. Prerequisites: FON 141 and ZOL 202.

445 Quantity Food Production. (3) F

Standard methods of food preparation in quantity; operation of institutional equipment, menu planning for institution. Experience in quantity food service. Prerequisites: FON 141, 343†, and 344†, or approval of instructor. One lecture, 6 hours laboratory. May require field trips.

446 Human Nutrition Assessment Laboratory. (4) S

Clinical and bio-chemical evaluation of nutritional status. Prerequisites: CHM 367† and FON 440† or 441†. One lecture, 9 hours laboratory.

448 Community Nutrition. (3) F

Food-related behaviors; community organization and delivery of nutrition services; program design, implementation, and evaluation strategies; and nutritional assessment of population groups. Prerequisite: FON 141. SOC 101 and PGS 100 are recommended.

450 Nutrition in the Life Cycle I. (1-3) F

Three 5-week modules: a) Pregnancy and lactation, b) Infancy, c) Childhood (1-12 years). Prerequisite: FON 141 and approval of instructor. One credit for each module.

451 Nutrition in the Life Cycle II. (1-3) S

Three 5-week modules: 1) Adolescent, b) Young and Middle Adulthood, c) Older Adult. Prerequisite: FON 141 and approval of instructor. One credit for each module.

462 Consumer Service in Foods. (3) F, S

Organization, economics, and marketing as related to the food and equipment industries. Prerequisites: HEE 153, FON 142.

541 Recent Developments in Nutrition. (3) S

Survey of research. Prerequisite: FON 440† or 441† or approval of instructor.

542, 543 Current Research in Nutrition I, II. (1, 1) F, S

I. Vitamins and Minerals. II. Carbohydrates, Lipids, and Proteins. Prerequisite: FON 141† or equivalent or approval of instructor.

548 Recent Developments in Foods. (3) S

Discussion and critique of current research. Prerequisites: FON 142 and CHM 232†.

HOME ECONOMICS

HEC 230 Family Environment Interaction. (3) F, S

Ecological study of the family. For home economics majors only.

430 Contemporary Issues in Home Economics. (3) F, S

Significant national and international issues and public policies affecting individual and family well being. For majors only. Prerequisite: HEC 230.

451 Field Experience. (1-3) F, S

Supervised study in the area of student's specialization (CDE, DEH, FAS, FON, HEE, TXC) in cooperation with community business institutions. Students must make arrangements with instructor one semester in advance of enrollment. Prerequisite: completion of 60 hours and approval of instructor. For Family Management (FAS) majors, prerequisite: FAS 357. May be repeated for a total of 3 hours. For Textiles and Clothing (TXC) majors intern program (credit 12 hours), prerequisite: grade point average of 3.0, senior standing the semester of program participation, TXC 122, ECN 201 or 202, MKT 300.

500 Research Methods. (3) F

Purposes of research. Experimental design, methods of data collection, thesis proposal development.

HOME ECONOMICS EDUCATION

HEE 153 Analysis of Home Equipment. (3) F, S

Equipment for the home. Principles of construction, operation, selection and effective use of equipment. Two lectures, 2 hours laboratory. May include field trips.

453 Advanced Analysis of Home Equipment. (3) F

Current trends in home appliances. Adaptations for individuals having special needs. Kitchen and laboratory planning. Prerequisite: HEE 153 or approval of instructor. Two lectures, 2 hours laboratory. May include field trips.

461 Presentations in Home Economics. (1-3) F, S,

I, Application of demonstration principles; II, Multimedia presentations; III, Development of audiovisual materials for home economics. Prerequisites: junior standing and approval of instructor. One hour lecture, 4 hours laboratory for each module.

480 Methods of Teaching Home Economics. (3-4) F, S
Instruction, organization, presentation and evaluation of subject matter in home economics. HEE students register for 4 credits. Dietetic students register for 3 credits.

481 Teaching Occupational Home Economics. (3) S
Career orientation related to home economics, cooperative work-related instruction, programs and youth club advisement associated with secondary home economics programs. Open only to home economics majors or minors. May include field trips.

582, 583 Program Planning and Evaluation in Home Economics. (3, 3) F '81, S '82
Process of planning and providing accountability for individual progress.

584 Current Trends of Teaching Home Economics. (3) F '82

Focus on teaching home economics related to current issues and problems facing families and society. Open only to home economics majors or minors.

585 Administration and Supervision of Home Economics Education. (3) F '82

Development of individuals for state, city, school, and college leadership roles. Emphasis on supervision of students teachers.

586 Current Trends of Teaching Home Economics. (3) S
Focus on teaching home economics related to current issues and problems facing families and society. Open only to home economics majors or minors.

TEXTILES AND CLOTHING

TXC 122 Clothing and Human Behavior. (3) F, S
Emphasizes cultural influences, human behavior and design.

123 Clothing Construction. (3) F, S
Construction processes related to fabrics, design and fashions. Course may be waived on successful completion of a placement test given each semester during registration week. One lecture, 4 hours studio.

223 Introduction to Textiles. (3) F, S
Basic properties, processing, end uses, and care of textile products.

321 Pattern Designing. (3) F, S
Flat patterns used to develop fundamental principles in designing individualized garments. Prerequisites: TXC 122, 123. One lecture, 4 hours studio.

323 Advanced Textiles. (3) F, S
Textile technology, fiber science, dyeing, finishing, and other topics. Prerequisites: TXC 223, CHM 101; CHM 231† is recommended. Two lectures, 2 hours laboratory. May include field trips.

423 Apparel Analysis. (3) F, S
Specialized processes used with a wide variety of apparel fabrics. Interrelationships between fabric properties and apparel design. Prerequisite: TXC 321†. Two lectures, 2 hours studio. May include field trips.

424 History of Costume. (3) F, S
Evolution of costume from ancient Egypt to the 20th century. Prerequisites: TXC 122 and an ARH course. May include field trips.

425 Twentieth Century Apparel. (3) S
Cultural, decorative, and functional influences on clothing. Prerequisite: TXC 424†.

426 The Clothing and Textile Industries. (3) F, S
Organization and marketing problems and practices specific to the textile and clothing industries. Prerequisites: TXC 122, 223, ECN 201.

429 Textile Analysis. (3) N
Introduction to textile testing equipment and evaluation of data. Prerequisite: TXC 323†. Two lectures, 2 hours laboratory. May include field trips.

521 Experimental Textile Analysis. (3) N
Current textile research and methods. Individual projects relating to textile performance. Prerequisite: approval of instructor. May include field trip.

523 Sociopsychological Aspects of Clothing. (3) N
Socio-psychological theories to the selection and use of clothing. Prerequisites: TXC 122; SOC 101, ECN 201.

526 Clothing and Textile Economics. (3) N
A profile of textiles-related industries, government and labor demands, consumer expectations, and new products and markets. Prerequisites: ECN 201 and two textile courses.

Special Courses: CDE, DEH, FAS, FON, HEC, HEE, TXC 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 32-33.)

Liberal Arts

Interdisciplinary (LIA) courses offered by the College of Liberal Arts.

LIA 100 University Adjustment and Survival. (2) F, S
Analysis of student motivation and goals. Reinforcement of language facility and study skills. Use of the library. Orientation to University resources and procedures. Special section offered for mature women returning to higher education. (F only).

101 The Use of Research Libraries. (1) F, S
Interdisciplinary resources and services of the University Library, with an emphasis on research. Open to freshmen and sophomores.

171H, 172H, The Human Event. (3-3) F, S
Landmarks in the social and intellectual development of the human race, with emphasis on Western Civilization. Enrollment restricted to members of the Honors Program. Consult the Honors office for applicability to General Studies requirements.

197H Honors Seminar for Freshmen. (1) S
Enrollment restricted to members of the Honors Program.

401 The Meaning of the 20th Century. (2-3) S
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.

Special Courses: LIA 294, 298, 484, 492, 493, 494, 497, 498, 499.

Mathematics

PROFESSORS:

H. A. SMITH (PS A-216), ANDERSON, BUSTOZ, FELDSTEIN, GOLDSTEIN, GOLUBITSKY, GRACE, JACOBOWITZ, KELLY, LEONARD, NERING, SAVAGE, SHERMAN, L. SMITH, A. WANG, C. WANG

ASSOCIATE PROFESSORS:

BEDIENT, DRISCOLL, HASSETT, HELTON, IHRIG, ISMAIL, KUIPER, KURTZ, McDONALD, McMAHON, MOORE, NIELSON, SANSONE, STEWART, SWIMMER, WEISS, YOUNG

ASSISTANT PROFESSORS:

AICKIN, FARMER, KEYFITZ, LAKE, LISKOVEC, McCARTER, NIEMEIR, PECK, H. L. SMITH

Departmental Major Requirements**Bachelor of Arts Degree Curriculum**

Mathematics—Consists of 45 semester hours of which at least 30 must be in mathematics and the remaining hours in closely related fields to be approved by the advisor. The required courses must include MAT 270†, 271†, 272†, 219†, 342†, 371† or 460†, 374†, two 400-level mathematics courses to be approved by the advisor, and CSC 100† or 183†. The department recommends a one-year sequence in some closely related field. Students who plan to attend graduate school in mathematics should consult their advisor concerning an appropriate curriculum as early as possible.

Bachelor of Science Degree Curriculum

Mathematics Consists of 55 semester hours of which at least 40 must be in mathematics and the remaining hours in closely related fields to be approved by the advisor. The required hours must include MAT 270†, 271†, 272†, and 342†, and CSC 100† or 183†. To satisfy the remaining required hours the following options are available:

General Mathematics Option. Requires MAT 219†, 371†, 372† and 374†. The remaining hours in mathematics are to be approved by the advisor and must include 9 hours at the 400-level. The department recommends a one-year sequence in some closely related field.

Computational Mathematics Option. Please contact the Department of Mathematics office for specific details.

Applied Mathematics Option. Requires 371†, 372†, 374†, 422†, 451†, 461†, 462†, 464†. PHY 115-116 also is required and the corresponding laboratory course (PHY 117-118) is strongly recommended. Students should choose additional courses from MAT 415†, 416†, 419†, 421†, 423†, 425†, 427†, 443†, 463†, 465†, 472† and 475†, and CSC 101†.

Probability, Statistics, Operations Research Option. Requires 219†, 371†, 372†, 421† and at least two courses chosen from 422†, 423†, 425†, 427†. The remaining hours in mathematics are to be approved by the advisor and must include at least two courses. It is recommended that these courses be chosen from MAT 422†, 423†, 425†, 427†, 464†, 465†, and 466†, and CSC 101†. A one-year sequence in a closely related field is also recommended.

Departmental Major Teaching Field Requirements**Bachelor of Arts in Education Degree Curriculum**

Mathematics—Option 1. Consists of at least 36 semester hours in mathematics. Required courses are MAT 219†, 270†, 271†, 272†, 310†, 342†, 371† or 374† or 460†, 420†, 443† and 483†, and CSC 100† or 183†. MAT 482† is required as part of the 31-hour professional education requirement, but cannot be counted as part of the 36-hour major requirement.

Mathematics—Option 2. This option may be exercised only in combination with Option 2 in Chemistry (page 69) or Physics (page 116). The mathematics portion of this 60-hour program consists of 30 semester hours of credit in mathematics. Required courses are MAT 219†, 270†, 271†, 272†, 310†, 342†, 371† or 374† or 460†, and 443†. A computer science course (CSC 100† or 183†) is recommended.

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

Mathematics—Consists of at least 24 semester hours of credit. Required courses are MAT 219†, 270†, 271†, 272†, 310†, 342†, and one of 371†, 374†, 460†.

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.

MATHEMATICS

MAT 105 The Creative Art of Mathematics. (3) F,S,SS
Designed to acquaint students in the arts, humanities and social sciences with the nature of modern mathematics. Recommended for students electing a single mathematics course.

106 Intermediate Algebra. (1-3) F,S,SS
Topics from basic algebra such as linear equations, polynomials, factoring, exponents, roots and radicals. [Students must register for 3 credits, except under special arrangement with the Department of Mathematics.] Prerequisite: One year of high school algebra.

107 Basic Computer Programming. (3) F,S,SS
For nonmathematics majors. Simple programming language, time-shared communication with computers, elementary data processing. (Does not satisfy Liberal Arts General Studies Laboratory requirement.) Two lectures, 2 hours laboratory.

115 College Algebra and Trigonometry. (4) F,S,SS
A pre-calculus course on those topics in algebra and trigonometry which are essential to the study of analytic geometry and calculus. Not open to students with credit in MAT 117 or 118. Prerequisite: three semesters of high school algebra or MAT 106†.

117 College Algebra. (3) F,S,SS
A pre-calculus course on topics in algebra and properties of elementary functions which are essential to the study of analytic geometry and calculus. Not open to students with credit in MAT 115. Prerequisite: three semesters of high school algebra or MAT 106†.

118 Plane Trigonometry. (2) F,S,SS
A pre-calculus course on topics in trigonometry which are essential to the study of analytic geometry and calculus. Not open to students with credit in MAT 115. Prerequisite: MAT 117† or equivalent.

119 Finite Mathematics. (3) F,S,SS
Topics from set theory, probability and linear algebra. Applications will be emphasized. Prerequisite: MAT 115† or 117† or equivalent.

141 Mathematics for the Social, Life and Management Sciences. (2-4) F,S,SS
Set theory, systems of equations, matrix algebra and other topics of interest to students in the social, life, and management sciences. May be taught with 3 lectures and 2 recitations per week or as a regular lecture meeting 4 hours per week. Prerequisite for 4-credit option: MAT 106†; prerequisite for 2-credit option: MAT 117† or equivalent.

180, 181 Theory of Arithmetic. (3-3) F,S,SS
Number systems, intuitive geometry, elementary algebra, and measurement. Recommended for prospective elementary school teachers. Prerequisite for MAT 181: MAT 180 or approval of instructor.

210 Mathematical Analysis. (3) F,S,SS
Differential and integral calculus of elementary functions, with applications. Not open to students with credit in MAT 260, 270 or 290. Prerequisite: Mat 115† or 117† or 141† or equivalent.

219 Finite Mathematical Structures. (3) F,S
Topics from set theory, combinatorial analysis, probability, statistics, linear algebra, linear programming, graph theory, and stochastic processes. Prerequisite: MAT 117† or equivalent.

226 Elements of Statistics. (3) F,S,SS
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 MAT 106†.

242 Elementary Linear Algebra. (2) F,S,SS
Introduction to matrices, systems of linear equations, determinants, vector spaces, linear transformations, and eigenvalues. Emphasizes development of computational skills. Prerequisite: MAT 115† or equivalent.

243 Discrete Mathematical Structures. (3) F
Introduction to lattices, graphs, Boolean algebras, and groups, with emphasis on topics relevant to computer science. Prerequisite: sophomore standing, or approval of instructor.

260, 261 Technical Calculus I, II. (3-3) F,S,SS
Analytic geometry, differential and integral calculus of elementary functions emphasizing physical interpretation and problem solving. Not open to students with credit in MAT 270 or 290. Prerequisite for MAT 260: MAT 115† or equivalent; prerequisite for MAT 261: MAT 260† or approval of instructor.

262 Technical Calculus III. (3) S
Infinite series and differential equations emphasizing physical interpretation and problem solving. Prerequisite: MAT 261† or approval of instructor.

270 Calculus with Analytic Geometry I. (4) F,S,SS
Real numbers, limits, and continuity, differential and integral calculus of functions of one variable. [Not open to students with credit in MAT 290. The sequence MAT 270-271 may be substituted for MAT 290 to satisfy requirements of any curriculum.] Prerequisites: MAT 115†, or 117† and 118†, or equivalent.

271 Calculus with Analytic Geometry II. (4) F,S,SS
Methods of integration, applications of calculus, elements of analytic geometry, improper integrals, sequences and series. [Not open to students with credit in MAT 291. The sequence MAT 270-271-272 may be substituted to satisfy requirements for MAT 290-291.] Prerequisite: MAT 270† or equivalent.

272 Calculus with Analytic Geometry III. (4) F,S,SS
Vector-valued functions of several variables, multiple integration, introduction to vector analysis. [The sequence MAT 270-271-272 may be substituted to satisfy requirements for MAT 290-291.] Prerequisite: MAT 271† or equivalent.

274 Elementary Differential Equations. (3) F,S,SS
Introduction to ordinary differential equations, adapted to the needs of students in engineering and the sciences. Prerequisite: MAT 271† or equivalent is required; credit or concurrent registration in MAT 272† or equivalent is recommended.

290 Calculus I. (5) F,S
Differential and integral calculus of elementary functions; topics from analytic geometry essential to the study of calculus. Prerequisites: MAT 115†, or 117† and 118†, or equivalent.

108 MATHEMATICS

291 Calculus II. (5) F,S

Further applications of calculus, partial differentiation, multiple integrals, and infinite series. Prerequisite: MAT 290† or equivalent.

302 Abstract Computing Machines. (3) S

Representations of finite state machines. Equivalence and reduction. Homing and distinguishing experiments. Machine identification. Machine decompositions. Memory and information loss. Equivalent to CSC 355. Prerequisite: MAT 243†.

310 Introduction to Geometry. (3) F,S

Congruence, area, parallelism, similarity and volume, Euclidean and non-Euclidean geometry. Prerequisite: MAT 272† or equivalent.

326, 327 Intermediate Statistics. (3-3) F,S

Elementary probability theory, probability functions, distribution functions, point estimation, hypothesis testing, statistical tests, applications. Prerequisite for MAT 326: one semester of college calculus; prerequisite for MAT 327: MAT 326†.

342 Linear Algebra. (3) F,S,SS

Linear equations and matrices, vector spaces, determinants, linear mappings, eigenvalues, inner product spaces, and bilinear forms. Prerequisite: credit or concurrent registration in MAT 272†, or equivalent.

362 Advanced Mathematics for Engineers and Scientists I. (3) F,S,SS

Complex numbers, partial differentiation, multiple integrals, vector analysis and Fourier series. Prerequisite: MAT 272† or equivalent.

363 Advanced Mathematics for Engineers and Scientists II. (3) S

Special functions, complex variables, integral transforms, partial differential equations and probability. Prerequisites: MAT 274† and 362† or equivalent.

371 Advanced Calculus I. (3) F

Continuity, Taylor's theorem, partial differentiation, implicit-function theorem, vectors, linear transformations and norms in \mathbb{R}^n , multiple integrals, power series. Prerequisite: MAT 272† or equivalent, and credit or concurrent registration in MAT 342†.

372 Advanced Calculus II. (3) S

Maps from \mathbb{R}^n to \mathbb{R}^m , line and surface integrals, divergence and Stokes' theorems, \mathbb{R}^m — topology, series, uniform convergence, improper integrals. (Not open to students with credit in MAT 460). Prerequisite: MAT 371†.

374 Introduction to Ordinary Differential Equations. (3) F,S

First order equations, linear equations, constant coefficient equations, regular singular points, Bessel's equation, linear systems, existence, and uniqueness theorems. Prerequisite: Credit or concurrent registration in MAT 272†, or equivalent.

380 Arithmetic in the Elementary School. (3) F

Historical numeration systems, overview of elementary number theory including primes, factorization, divisibility, bases, modular systems, linear congruence, and continued fractions. Prerequisite: MAT 181† or approval of instructor.

381 Geometry in the Elementary School. (3) S

Informal geometry including concepts of length, area, volume, similarity, and congruence. Classification of figures, straightedge and compass constructions, motion geometry. Prerequisite: MAT 380† or approval of instructor.

400 Computability and Unsolvability. (3) A

Turing machines and computability, computable and partial computable functions, recursive sets and predicates,

recursively enumerable sets, unsolvable decision problems, applications. Prerequisite: MAT 243†.

401 Theory of Formal Languages. (3) S

Theory of grammar, methods of syntactic analysis and specification, types of artificial languages, relationship between formal languages and automata. Equivalent to CSC 459. Prerequisite: MAT 243† or 342†.

410 Introductory Topology. (3) F

Topology of the real numbers, equivalence of sets, transfinite induction. Designed to develop the student's critical faculties and creative abilities in mathematics. Prerequisite: MAT 272† or equivalent.

412 Projective Geometry. (3) N

Projective geometry and its relationship to Euclidean and other geometries. Prerequisite: MAT 342†. MAT 310† is recommended.

415 Combinatorial Mathematics I. (3) F

Permutations and combinations, recurrence relations, generating functions, graph theory and combinatorial proof techniques. Prerequisite: MAT 342†.

416 Combinatorial Mathematics II. (3) S

Continuation of MAT 415 considering some advanced aspects of the theory as well as applications. Topics to be chosen: transport networks, matching theory, block designs, coding theory, Polya's counting theory, and applications to the physical and life sciences. Prerequisite: MAT 415† or approval of instructor. MAT 443† is recommended.

419 Linear Programming. (3) S

Linear programming and the simplex algorithm, network problems, quadratic and nonlinear programming. Prerequisite: One semester of college calculus.

420 Introductory Applied Statistics. (3) F

Introductory probability, descriptive statistics, sampling distributions, parameter estimation, tests of hypotheses, chi-square tests, regression analysis, analysis of variance, nonparametric tests. Prerequisite: MAT 115† or 117† or 141† or equivalent.

421 Probability. (3) F

Laws of probability, combinatorial analysis, random variables, probability distributions, expectation, moment generating function, transformations of random variables, central limit theorem. Prerequisites: MAT 219† or 326†; and 371† or equivalent.

422 Deterministic Operations Research. (3) F

Deterministic inventory theory, linear programming, transportation and networks, deterministic dynamic programming, sequencing and scheduling, basic nonlinear programming, search problems. Prerequisite: MAT 342†.

423 Stochastic Operations Research. (3) S

Probabilistic inventory theory, basic queueing theory, decision theory, probabilistic dynamic programming, decision problems on (semi) Markov chains, basic stochastic programming. Prerequisite: MAT 421†.

425 Stochastic Processes. (3) S

Markov chains, stationary distributions, pure jump processes, second order processes and other topics in stochastic processes. Prerequisites: MAT 421† and 342†.

427 Mathematical Statistics. (3) S

Limiting distributions, interval estimation, point estimation, sufficient statistics, tests of hypotheses. Prerequisite: MAT 421†.

431 Foundations of Mathematics. (3) A

Topics from mathematical logic and set theory. May be repeated for credit with approval of instructor. Prerequisite: MAT 342† or approval of instructor.

442 Advanced Linear Algebra. (3) F,S

Deeper and more abstract study of the topics in MAT 342. Invariant subspaces, canonical forms and matrices, linear programming, dual spaces, bilinear and quadratic forms, and multilinear algebra. Prerequisite: MAT 342† or equivalent.

443 Abstract Algebra. (3) F,S,SS

Introduction to the most important algebraic structures including groups, rings, integral domains, and fields. Prerequisite: MAT 342† or approval of instructor.

444 Topics in Abstract Algebra. (3) NR

May be repeated for credit with approval of instructor. Prerequisite: MAT 443†.

445 Theory of Numbers. (3) S

Prime numbers, unique factorization theorem, congruences. Diophantine equations, primitive roots, quadratic reciprocity theorem. Prerequisite: MAT 342†.

451 Mathematical Modeling. (3) A

An in-depth study of one or more mathematical models which occur in the physical or biological sciences. May be repeated for credit with approval of instructor. Prerequisites: MAT 274†, or 374†, and 242† or 342†, or approval of instructor.

460 Applied Real Analysis. (3) F,S

Vectors, curvilinear coordinates, Jacobians, implicit function theorem, line and surface integrals, Green's, Stokes' and divergence theorems. (Not open to students with credit in MAT 372). Prerequisites: MAT 274† or 374†, and 242† or 342†.

461 Applied Complex Analysis. (3) A

Analytic functions, complex integration, Taylor and Laurent series, residue theorem, conformal mapping, and harmonic functions. Prerequisite: MAT 272† or equivalent.

462 Partial Differential Equations. (3) A

Second order partial differential equations, emphasizing Laplace, wave and diffusion equations, solutions by the methods of characteristics, separation of variables and integral transforms. Prerequisite: MAT 274† or 374†.

463 Transform Theory and Operational Methods. (3) A

Fourier, Laplace, and other transforms; applications to boundary value problems; generalized functions and modern operational mathematics. Prerequisite: approval of instructor.

464 Numerical Analysis I. (3) F

Theory and methods for: numerical solution of algebraic and transcendental equations; iterative methods; approximation; quadrature; solution of differential equations. Those seeking a methods survey course should take MAT 466. Prerequisites: Fluency in computer programming (preferably Fortran), and MAT 342† and 371†, or approval of instructor.

465 Numerical Analysis II. (3) S

Continuation of MAT 464. Prerequisite: MAT 464†.

466 Applied Computational Methods. (3) F,S

Numerical methods for: quadrature, differential equations, roots of nonlinear equations, interpolation, approximation, linear equations, floating-point arithmetic, roundoff error.

Prerequisites: Fluency in computer programming (preferably Fortran), and MAT 271† or equivalent, or approval of instructor.

467 Computer Arithmetic. (3) S

Number systems, hardware/software arithmetic, overflow, significance, rounding, multiple precision, automatic error control; impact on languages, architectures, robust programming, software development. Prerequisites: CSC 101†, or 200†, or 383†, or MAT 464†, or 466†, or approval of instructor.

472 Intermediate Real Analysis. (3) N

Introduction to the Lebesgue integral, metric spaces, normed spaces, fixed point theorems, orthogonal bases, Fourier series. Prerequisites: MAT 342† and 372†, or approval of instructor.

475 Differential Equations. (3) S

Asymptotic behavior of solutions of linear and non-linear ordinary differential equations, stability, Sturm-Liouville problems, boundary value problems, singular point behavior of autonomous systems. Prerequisite: MAT 374† or equivalent.

480 Mathematics in the Upper-Elementary Grades. (3) F

An introduction to probability and statistics including open-ended data gathering and processing, counting techniques, sampling strategies, estimation, and decision making. Prerequisite: MAT 381† or approval of instructor.

481 Mathematics in the Upper-Elementary Grades. (3) S

Elementary functions and their applications. A thorough investigation of some of the algorithms of basic arithmetic. Prerequisite: MAT 480† or approval of instructor.

482 Methods of Teaching Mathematics in Secondary School. (3) F,SS

Examination of secondary school curricular material, analysis of instructional devices. Teaching strategies, evaluative techniques, diagnosis and remediation, and problem solving. Prerequisite: approval of instructor.

483 Mathematics in the Secondary School. (3) S,SS

Topics in geometry, number theory, algebra, and analysis. Emphasis on unifying principles. Prerequisite: MAT 310† or 412† or approval of instructor.

485 History of Mathematics. (3) S

Topics from the history of the origin and development of mathematical ideas. Prerequisite: MAT 272† or equivalent.

504 Computer Performance Evaluation. (3) S

Topics in computer system measurement and evaluation: hardware/software monitors, workload characterization, program behavior, adaptive scheduling, simulation models, measurement interpretation. Prerequisite: CSC 430†.

507 Operating System Theory. (3) F

Formal methods applied to: control of concurrent processes, deterministic and probabilistic scheduling, auxiliary storage, paged storage allocation, multi-programmed memory management. Prerequisites: MAT 326† and CSC 430†.

508 Advanced Compiler Construction. (3) S

Formal parsing strategies, optimization techniques, self-compiling compilers, compiler writing systems, extensibility and transportability considerations, recent developments. Prerequisite: CSC 440†.

509 Topics in Computer Science. (3) NR

Prerequisite: approval of instructor. May be repeated for credit with approval of instructor.

110 MATHEMATICS

510, 511 Point Set Topology. (3-3) F,S

Topological spaces, metric spaces, compactness, connectedness, local properties, product and decomposition spaces, mappings, covering properties, separation properties. Prerequisite: MAT 371† or 410† or approval of instructor.

524, 525 Advanced Probability. (3-3) N

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: MAT 421† and 571†, or approval of instructor.

526, 527 Theory of Statistical Linear Models. (3-3) F, S

Multinomial distribution, distribution of quadratic forms, full and non-full rank models, generalized inverses, unbalanced data, variance components, large sample theory. Prerequisites: MAT 427†, and knowledge of matrix algebra.

528 Topics in Stochastic Processes. (3) N

Prerequisite: approval of instructor. May be repeated for credit with approval of instructor.

529 Topics in Statistics. (3) A

Prerequisite: approval of instructor. May be repeated for credit with approval of instructor.

530 Applied Regression Analysis. (3) F

Method of least squares, simple and multiple linear regression, polynomial regression, analysis of residuals, dummy variables, model building. Prerequisite: MAT 420† or equivalent.

531 Applied Analysis of Variance. (3) S

Factorial designs, balanced and unbalanced data, fixed and random effects, randomized blocks, latin squares, analysis of covariance, multiple comparisons. Prerequisite: MAT 420† or equivalent.

532 Applied Nonparametric Statistics. (3) F

One sample tests, tests of two or more related or independent samples, measures of correlation, tests of trend and dependence. Prerequisite: MAT 420† or equivalent.

533 Applied Multivariate Analysis. (3) S

Discriminant analysis, principal components, factor analysis, cluster analysis, canonical correlation. Prerequisite: MAT 420† or equivalent.

534 Applied Discrete Data Analysis. (3) S

Models for discrete and count data, measures of association, log-linear and regression models for contingency tables. Prerequisite: MAT 420† or equivalent.

543, 544 Abstract Algebra. (3-3) F,S

Groups, modules, rings and fields, Galois theory, homological algebra, representation theory. Prerequisite: MAT 444† or approval of instructor.

550, 551 Methods of Mathematical Physics. (3-3) F,S

Matrices, orthogonal functions, integral equations, calculus of variations, eigenvalue problems, perturbation methods, boundary value problems. Prerequisites: MAT 342†, and 372† or 461†, or approval of instructor. May be repeated for credit with approval of instructor.

552, 553 Tensor Analysis. (3-3) F,S

Algebra and calculus of tensors and differential forms; applications to geometry and various branches of applied mathematics. Prerequisites: MAT 342†, and 371† or 460†, or approval of instructor.

564, 565 Advanced Numerical Analysis. (3-3) NR

Finite difference equations, orthogonal polynomials, quadrature, approximation and integration theory, numerical

solution of differential equations, numerical linear algebra. Prerequisite: MAT 464† or approval of instructor. May be repeated for credit with approval of instructor.

569 Topics in Analysis. (3) N

Prerequisite: approval of instructor. May be repeated for credit with approval of instructor.

570, 571 Real Analysis. (3-3) F,S

Lebesgue integration, selected function spaces, differentiation, abstract measure theory, elements of functional analysis. Prerequisite: MAT 372† or approval of instructor.

572, 573 Complex Analysis. (3-3) F, S

Analytic functions, series and product representations, entire and meromorphic functions, normal families, Riemann mapping theorem, harmonic functions, Riemann surfaces. Prerequisite: MAT 371† or approval of instructor.

574, 575 Theory of Ordinary Differential Equations. (3-3) N

Systems, existence proofs, singularities, asymptotic behavior of solutions, boundedness of solutions, eigenvalues and eigenfunctions, perturbation theory. Prerequisite: MAT 372† or approval of instructor.

576, 577 Theory of Partial Differential Equations. (3-3) N

Existence and uniqueness theorems, boundary value and initial value problems, characteristics, Green's functions, maximum principle, distributions, and weak solutions. Prerequisite: knowledge of Lebesgue integration or approval of instructor.

578, 579 Functional Analysis. (3-3) N

Locally convex, normed and Hilbert spaces. Linear operators, spectral theory, and application to classical analysis. Prerequisite: MAT 472†, or 571† or approval of instructor.

582 Modern Mathematics for Teachers. (3) A

Theory of sets, real number system, transfinite numbers and other selected topics. Prerequisite: approval of instructor.

583 Abstract Algebra for Teachers. (3) A

Postulational approach to algebra, elementary mathematical systems including groups and fields. Prerequisite: approval of instructor.

584 Teaching College Mathematics. (3) A

Methods and learning difficulties in the teaching of instructional lower-division college mathematics courses. Prerequisite: approval of instructor.

585 Modern Geometry for Teachers. (3) A

Euclidean, projective and non-Euclidean geometries. Prerequisite: approval of instructor.

587, 588 Analysis for Teachers. (3-3) N

Subject matter in mathematics appropriate for accelerated programs in secondary schools, including analytic geometry and calculus. Prerequisite: approval of instructor.

591 Seminar. (1-3) N

Topics may be selected from the following:

- | | |
|-------------------------|---------------------------|
| (a) Analysis | (g) Mathematical Logic |
| (b) Applied Mathematics | (h) Numerical Analysis |
| (c) Probability | (i) Computer Science |
| (d) Topology | (j) Mathematics Education |

- | | |
|--------------------------------|--|
| (e) Algebra | (k) Combinatorial |
| (f) Mathematical
Statistics | Mathematics
(l) Operations Research |

Special Courses. MAT 294, 298, 492, 493, 494, 498, 499, 590, 592, 594, 598, 599, 792, 799. (See pages 32-33.)

Military Science

(Army ROTC)

PROFESSOR:

MURCHISON (MAIN 240)

ASSISTANT PROFESSORS:

GESIN, GREENE, HOPPER, MORGAN, SCOTT,
SPARKS, VAN BREDERODE

Purpose. The Department of Military Science curriculum consists of the Basic Course (MIS 101, 102, 203, and 204) and the Advanced Course (MIS 301, 302, 401, and 402). The goal of this professional education is to prepare selected students with leadership potential to be commissioned Army officers within the national defense structure of the United States. Specific objectives include developing the leadership and managerial potential of the students; developing students' abilities to think creatively, to speak and write effectively; providing the student with an appreciation of the requirements for national security; and developing the students' understanding of the nature and functions of the U.S. Army. Upon successful completion of the advanced course, qualified students will receive commissions in the United States Army Reserve or Army National Guard. Active duty positions are available upon graduation from the University.

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

General Qualifications. Male or female students entering Army ROTC must: (1) be a 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 32. Students with previous

military service or 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) Passing of the ROTC Qualifying Examination. (3) Passing the Army physical examination. (4) Attainment of a minimum cumulative grade point average of 2.0 ("C") for the first two years of college work and maintenance of that minimum during the period while enrolled in the Advanced Course.

Four-Year Program. Students may enroll in Army ROTC during their freshman year. They take the Basic Course during the first two years, receiving a total of 8 semester hours credit for the four semesters of study. Upon satisfying the requirements stated above, they enter the Advanced Course where they will earn 10 semester hours of credit for the four semesters of study. In addition, students will attend a six-week advanced summer camp at Ft. Lewis, Washington, between their junior and senior years. Upon successful completion of the Advanced Course and requirements for a degree, they are commissioned as Second Lieutenants in the United States Army Reserve or Army National Guard.

Two-Year Program. Students must have at least two academic years of college work remaining, either at the undergraduate or graduate level, or a combination of the two. This program is open to all students with the exception of three and four-year scholarship winners (see scholarships). Students seeking enrollment in the two-year program should make application during the spring semester of the year in which they desire to enter the program. High school students should apply during their senior year of high school. They must pass the ROTC Qualifying Examination, and the Army physical examination. After successfully completing a six-week basic camp at an Army post (normally conducted during June and July) or completing the basic course classes during a University Summer Session, students may enroll in the Advanced Course. Students with previous military experience, high school ROTC credit, or who are currently members of the National Guard or Reserves may be admitted directly into the two-year program. They then follow the same

program and meet the same requirements as stated for Advanced Course students in the four-year program.

Pay and Allowances. Advanced Course students receive \$100 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 camp. Uniforms, housing and meals are provided at camp without cost to the students and they are reimbursed at the current mileage rate for travel to and from the camp. Students who attend basic camp receive the pay of an Army recruit during attendance at basic camp as well as the current mileage rate for travel to and from the camp.

Simultaneous Membership Program. A newly authorized program which allows membership in the Army Reserve or National Guard at the same time a student is in ROTC. This new program pays over \$1,000 each semester the student attends college.

Scholarship Programs. The Army ROTC offers scholarship programs for outstanding young men and women who are motivated toward a career as professional officers in the Regular Army. These scholarships pay for all fees, tuition and books, and provide \$100 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 in accordance with a schedule furnished high school counselors. Selection is made on a nation-wide 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 all students in good standing with the University; previous ROTC or military experience is not required for application for three and two-year scholarships; 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 a service commitment to serve in the active Army for a period of four years after commissioning and graduation.

Active Duty Requirements. Graduates of Army ROTC may serve as officers in the Army National Guard, Army Reserve or active Army. Active duty commitments vary

from three years to as little as three months. Scholarship students have a four-year active duty commitment.

Graduate and Professional Studies Programs. A delay from call to active duty for up to four years is available to outstanding students who desire to earn graduate or professional degrees. 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, osteopathy, and clinical psychology.

MILITARY SCIENCE

MIS 101 Introduction to Military Science. (2) F,SS
Organization and mission of the Army within American society; current issues in the military; military justice system; basic leadership skills.

102 Methods of Instruction. (2) S,SS
Learning theories and principles of instruction; development of instructor knowledge, skills, and characteristics; instructional aids; student presentations; evaluation techniques.

203 Land Navigation and Survival. (2) F,SS
Components of maps; use of map and compass; orienteering and land navigation exercises; military mapping system; basic outdoor survival skills.

204 Leadership and Military Management. (2) S,SS
Interdisciplinary approach to leadership and management; ethics, responsibility and conduct of military officers; effective decision-making techniques; introduction to drill and ceremonies.

301 Advanced Military Science. (3) F, S
Theory, organization, and dynamics of the individual soldier and military units in combat operations; small unit offensive tactics. Prerequisites: MIS 201† and 202†, or equivalent. Three lectures-conferences, 1½ hours of Leadership Practical Application, one three-day field trip, one one-day field trip.

302 Advanced Military Science. (3) F, S
Theory and dynamics of military units in combat operations; small unit defensive operations; command and staff organization and relationships; additional duties of career officers; roles of the branches of the Army. Prerequisites: MIS 201† and 202†, or equivalent. Three lectures-conferences, 1½ hours Leadership Practical Application, one three-day field trip; one one-day field trip.

401 Advanced Military Science. (2) F
The military legal system; evolution of the U.S. Army; selected campaigns and leaders through the Spanish American war; opposing strategies; objectives, attitudes, relationships to changing social, economic, political and military institutions. Prerequisites: MIS 301† and 302†. Two lectures-conferences, 1 hour Leadership Practical Application, 3-day field trip.

402 Advanced Military Science. (2) S
Selected campaigns and leaders from 1917 to the present; U.S. position in the contemporary world and its impact on military command and management; career planning and personal affairs. Prerequisites: MIS 301† and 302†. Two lectures, 1 hour Leadership Practical Application, 3-day field trip.

Philosophy and Humanities

PROFESSORS:

ARNER, CARNEY, DOEBLER, MURPHY, PASTIN

ASSOCIATE PROFESSORS:HUMPHREY (PS A-521), FITCH, GIESCHEN,
GULESERIAN, KOTROZO, LIU, WHITE**ASSISTANT PROFESSORS:**CREATH, GREGORY, HOWELLS, STONE,
VOTICHENKO**Departmental Major Requirements****Bachelor of Arts Degree Curriculum**

Philosophy—The major in philosophy consists of 45 semester hours of credit. Thirty-six hours must be in philosophy, including 30 upper division hours, and 9 hours in related fields to be determined by the student in consultation with an advisor. Required courses are PHI 113, 301, 302, 305; 312 or 314; 316 or 317; and at least two 400-level courses. Students planning to do graduate work in philosophy should consult an advisor in order to select appropriate 400-level courses. A minimum 2.0 grade average is necessary for all courses fulfilling the major requirements. (See Graduation Requirements, page 39.)

Departmental Graduate Programs

The Department of Philosophy and Humanities offers programs leading to the degree of Master of Arts that will prepare one for either teaching in a community college or pursuing a Ph.D. in philosophy. Consult the *Graduate Catalog* for requirements.

The Department also participates in the Master of Arts program in Humanities offered through the Committee on Humanities. Completion of the program results in a Master of Arts degree in Humanities granted by the Graduate College. Consult the *Graduate Catalog* for requirements.

Departmental Major Requirements**Bachelor of Arts Degree Program**

Humanities—The major in humanities consists of 45 semester hours. The student will take 29 hours in HUP designated courses. The remaining 16 hours, taken in satisfaction of the related fields requirement, must be focused in a single disciplinary area such as philosophy, English, literature, history, art history, theatre

history, or in an interdisciplinary area studies program such as film studies. Required humanities courses are HUP 101, 102; two from among 322 through 329; 311 or 312; 318; 320; one from among 413 through 415; and one upper division elective. The 16 hours taken in the related field will be determined in consultation with individual faculty advisors.

HUMANITIES

HUP 101, 102 Humanities in the Western World. (4,4) F,S

Interrelation of arts and ideas in Western Civilization. HUP 101, Hellenic through Medieval; 102, Renaissance to the present. Two lectures, 2 discussion meetings per week.

103, 104 Humanities in the Eastern World. (4,4) F,S

Interrelation of art, architecture, literature, music, philosophy, religion, theatre and other performing arts within the contexts of the major stylistic periods of Eastern civilization. Cultural achievements of the past as they relate to contemporary life. Two lectures, 2 discussion meetings per week. HUP 103, China; 104, India or Japan.

105 Introduction to Myth and Symbol. (3) F

Myth and symbol as expressive and structural elements of the humanities. Examples from mythology and artistic symbolism of the Western tradition.

110 Contemporary Issues in Humanities. (3) F,S

Responses of literature, art history, history, philosophy, religion and other disciplines to common problems affecting modern American Life.

150 Introduction to Eastern Asian Culture. (3) S

Introduction to the cultures of China, Japan, Korea. (Also listed as FLA 150).

201 Technology and Social Change. (2) F

Technology as related to social change, contemporary and possible future impacts of technology on society. (Also listed as STE 201.)

310 Man and Machine. (2) F

Mechanical invention and technical progress, and the evolution of social forms and institutions. (Also listed as STE 310.)

311, 312 Science and Technology in History. (3,3) F,S

Development and application of scientific knowledge and its effects on human aspirations and values from ancient times through the Industrial Revolution to present. HUP 311 not a prerequisite for HUP 312. (Also listed as STE 311, 312.)

313, 314 Comparative Arts of the East. (3,3) F, S

Intensive study of styles and forms in visual, verbal, and performing arts. HUP 313, China; 314, India or Japan. Prerequisite: HUP 103 for 313; 104 for 314.

315 The Asian Woman I, II, III. (1, 1, 1) A

Traditional and modern Asian woman in Eastern and Western societies. May be taken singly or in any combination. Three five-week modules: I—Film; II—Arts; III—Society.

316 Women and the Humanities. (3) F,S

Topics: women as artists; women and religion; women in art, literature, and the media; women in western culture. May be repeated when topics vary for a total of 6 hours.

114 PHILOSOPHY AND HUMANITIES

318 Perception and Judgment in the Arts. (3) A

Application of perception theory to the arts. Creativity, art forms as icons of reality; the role of language in evaluation.

320, 321 Myth and Symbol. (3) F,S

Mythologies in literary form. Theories about their relationship to the esthetic and intellectual dimensions of cultures. HUP 320, Theories of interpretation; primarily Greek and Mediterranean; 312, social and political aspects; may include Hindu, Celtic, Norse and others.

322, 324, 326, 327, 328, 329 Comparative Arts and Ideas to the West. (3 each) F,S

Art, architecture, literature, music, and the performing arts within the contexts of social institutions and religious and philosophic perspective. May be taken concurrently. Prerequisite: HUP 101 or 102, or approval of instructor.

322 The Ancient World

324 The Middle Ages

326 The European Renaissance

327 The Age of Reason

328 The Nineteenth Century

329 The Twentieth Century

365 Islamic Civilization. (3) F

An interdisciplinary survey of art, history, and religion.

402 Technology, Society and Human Values. (3) F, S, SS

Values which motivate mankind to create technology. Areas of conflict and resolution between basic human values and technological society. Reading and discussion with visiting lecturers. Prerequisite: junior standing or above. One lecture, two discussion meetings per week. (Also listed as STE 402.)

411 Social Effects of Invention. (3) S

Invention as an instrument of change in civilization. Assessment of effects of interaction of social, cultural, and technological forces. (Also listed as STE 411.)

413 Comedy: Meaning and Form. (3) S

Nature and characteristics of comedy in the literary, fine, and performing arts. Prerequisite: HUP 101 and 102 or equivalent.

414 Tragedy: Meaning and Form. (3) A

Nature and characteristics of literary and artistic expressions called tragic. Prerequisite: HUP 101 and 102 or equivalent.

415 Satire: Meaning and Form. (3) A

Nature and characteristics of satire in the literary, fine and performing arts. Prerequisite: HUP 101 and 102 or equivalent.

494 Special Topics in the Humanities. (3) N

Open to all students. Topics include:

- Western Historical or Contemporary Cultures
- Non-Western Cultures
- Cultures of Ethnic Minorities
- American Fine Arts
- Comparative Fine and Performing Arts

498 Pro-Seminar in the Humanities. (3) N

For students with a major or minor in humanities. Problems of comparative methodologies, and principles of syntheses of disciplinary areas in the humanities. Other students admitted with approval of instructor.

501 Cultural Synthesis. (3) A

Methodologies and comparative theories for the study of relationships between various aspects of culture, the history of ideas, and the arts. May be repeated for a total of 6 hours credit.

502 Theory and Criticism of the Arts. (3) S

Philosophical analysis of the esthetic experience and various works of art. Social, moral, and psychological functions of art. Definitions of art, artistic style, artistic truth.

505, 506 Esthetic Principles in Eastern Humanities. (3,3) F,S

Principles and issues in art and esthetics in the East. HUP 505, China; 506, India or Japan. Prerequisite: HUP 313 for 505; 314 for 506, or approval of instructor.

507 Comparative Esthetics: East/West. (3) A

Cross-cultural application of selected principles and issues in esthetics.

520 Esthetics of Film. (3) F,SS

Theory of film as an art form. Includes film image and language, film and reality, role and function of the film critic, and the experimental avant-garde.

550 Technology and the Arts. (3) F

The impact of technology on art, music, literature, dance, and other art forms. Industrial Revolution to the present with emphasis on the developments in the last decade.

591 Seminar. (3) N

Topics in the comparative arts may be selected from the areas listed below. Prerequisite: Humanities graduate student or approval of instructor.

- Ancient Near-East Cultures
- Ancient Greece
- Roman and Romanesque Worlds
- The Gothic Synthesis
- The Renaissance
- Baroque and Neo-Classical
- Romanticism
- The Contemporary World

Additional courses may be selected from Cultural Anthropology, Architecture, Art, Communication, Cultural Geography, Intellectual and Cultural History, Dance, Foreign Languages and English (Literature), Journalism and Telecommunication, Music, Philosophy, and Theatre.

Special Courses: HUP 294, 492, 493, 497, 499, 590, 592, 598, 599. (See pages 32-33.)

PHILOSOPHY

PHI 101 Introduction to Philosophy. (3) F, S, SS

Exploration of some basic philosophical problems concerning man, his values, and the nature of ultimate reality. Not open to students who have taken PHI 300.

103 Principles of Sound Reasoning. (3) F, S, SS

Fallacies, traditional logic of the syllogism, elementary parts of symbolic logic, inductive logic and other related topics.

111 Introduction to Ethics. (3) F, S, SS

Obligation, goodness, justice, morality and their relations to utility, moral reasoning, punishment, and social structure.

113 Introduction to Mathematical Logic. (3) F, S

Symbolic techniques emphasizing deductions and proofs in the propositional and first and second order predicate calculi. Either axiomatic or natural deduction systems may be used.

300 Existence, Knowledge and Value. (3) F, S, SS

A critical philosophical examination of man and society, God, the foundations of knowledge, and the nature of morality. Not open to students who have taken PHI 101.

301 History of Ancient Philosophy. (3) F

History of western philosophy from its beginnings through the Hellenistic period.

302 History of Modern Philosophy. (3) S

History of western philosophy from the Renaissance through Kant.

303 Contemporary Analytic Philosophy. (3) F

Aims and methods of such 20th century philosophers as Frege, Moore, Russell, Wittgenstein, Carnap, Ayer, Wisdom, Ryle, Austin, Strawson, Quine, and Sellars, with application to metaphysics and epistemology.

304 Existentialism and Phenomenology. (3) S

An introduction to this movement through a study of its major figures, e.g., Kierkegaard, Dostoevsky, Nietzsche, Husserl, Heidegger, Buber, Sartre, Camus, Merleau-Ponty, Binswanger, May, Frankl, and Ricoeur.

305 Ethics. (3) F, S

Investigation of moral conduct focusing on such concepts as goodness, rightness, duty, and justice; examination of theories such as deontology, utilitarianism, formalism, relativism, and egoism, in which these concepts occur.

306 Applied Ethics. (3) F, S, SS

Philosophical techniques are used to elucidate such vital moral issues as sexual perversion, civil disobedience, abortion, punishment, violence and pacifism, suicide, and euthanasia.

307 Philosophy of Law. (3) S

The nature and source of law and its relation to morality. Legal rights, legal enforcement of morals, civil disobedience, liability and responsibility, punishment, judicial reasoning, justice, property, differences between theories of natural and positive law.

308 Philosophy of Art. (3) S

Central problems in philosophy of art, e.g., the nature of a work of art, modern and traditional theories of art, esthetic perception and experience, objectivity and relativity in art criticism.

309 Social and Political Philosophy. (3) F, S

Alternative principles and methods relevant to problems of human association and conflict: justice and power, freedom and quality, autonomy and order are discussed.

310 Political Ideologies. (3) S

Principles underlying democracy, socialism, communism, anarchism, and fascism. Classical and modern authors consulted: e.g., Plato, Aristotle, Machiavelli, Hobbes, Hegel, Locke, Mill, Marx, Lenin, Bakunin, Sorel, and Marcuse.

311 Philosophy in Literature. (3) F, S, SS

The Oresteia, *The Divine Comedy*, *Moby Dick*, *The Trial*, and *The Four Quartets* introduce philosophical problems such as the nature of moral goodness and man's relation to the world and other men.

312 Theory of Knowledge. (3) S, SS

The nature, sources, and limits of human knowledge. Theories of truth; *a priori* concepts and knowledge; empirical concepts and knowledge, perception, induction; knowledge of the external world.

313 Symbolic Logic. (3) S

Methods of elementary mathematical logic. First-order predicate calculus, identity, descriptions, relations, soundness, and completeness will be considered. Prerequisite: PHI 103 or 113 or equivalent.

314 Philosophy of Science. (3) S

The structure and justification of scientific theories, explanation, and theory change. The roles of observation and laws, theoretical concepts and entities, reduction, probability, confirmation, space and time, and causation.

315 Philosophy of Language. (3) S

Problems pertaining to the nature of language: meaning, reference, truth, definition, analyticity, translatability, synonymy, and contributions of contemporary linguistics.

316 Metaphysics. (3) F, S

Investigation into the real: appearance vs. reality, perception, realism vs. idealism, materialism vs. mentalism, the concepts of mind and person; substance, universals, space and time, causation.

317 Philosophy of Mind. (3) S

Nature of consciousness. The common sense view of mind and perception, behaviorism, materialism, dualism, phenomenalism, self-knowledge, knowledge of other minds.

318 Philosophy of Religion. (3) F, S, SS

Nature and justification of religious belief. Arguments for the existence of God, mysticism, theistic and pantheistic conceptions of God and creation.

319 Indian Philosophy. (3) F

Selections from the *Upanishads* and the *Gita* and of representative orthodox and heterodox Indian schools, including the Carvaka, Jain, Nyaya, Yoga, and Vedanta.

320 Buddhist Philosophy. (3) S

The philosophic expressions of the principal Southern and Northern Buddhist schools, beginning with Theravada and including Madhyamika, Vajrayana, and Zen.

325 Philosophy of Social Science. (3) F

Philosophical problems surrounding the aims, structure, and methods of theories in the social sciences.

330 Theory of Value. (3-4 per topic), F, S

Topics in ethics, esthetics or social philosophy, such as listed in PHI 305-310. In *Schedule of Classes*, title following course number indicates topic covered. Description of course materials is available in the departmental office. May be repeated for credit under different titles.

340 Topics in Metaphysics and Epistemology. (3-4 per topic), F, S

Metaphysical, epistemic, logical, or historical topics are examined, such as listed in PHI 312-319, but more concentrated. In *Schedule of Classes*, title following course number indicates topic covered. Description of course materials is available in the departmental office. May be repeated for credit under different titles.

401 Rationalism. (3) F

Examination of Descartes, Spinoza, Malebranche, Leibniz, Broad, Blanchard, and Chisholm. Prerequisite: one course from among PHI 302, 312, 315, 316, 317, 340 or any PHI 400-level course.

402 Empiricism. (3) S

Examines one or more philosophers such as Bacon, Hobbes, Locke, Hutcheson, Shaftesbury, Butler, Berkeley, Hume, Reid, Mill, Carnap, Ayer. Prerequisite: one course from among PHI 302, 312, 315, 316, 317, 340 or any PHI 400-level course.

403 German Idealism. (3) F

Examines one or more philosophers such as Kant, Fichte, Schelling, Hegel, Schopenhauer, and Nietzsche. Prerequisite: one course from among PHI 302, 312, 315, 316, 317, 340 or any PHI 400-level course.

404 Phenomenology. (3) S

Methodology of such philosophers as Brentano, Meinong, Husserl, Heidegger, Sartre, and Merleau-Ponty. Prerequisite: one course from among PHI 303, 304, 312, 315, 316, 317, 340 or any PHI 400-level course.

405 Pragmatism. (3) F

Examines such philosophers as Peirce, James, Dewey, Schiller, Lewis, Mead, Carnap. Prerequisite: one course from among PHI 302, 303, 312, 314, 315, 316, 317, 340 or any PHI 400-level course.

406 Philosophical Figures and Movements. (3) F, S

Detailed study of one or two prominent philosophers, e.g., Kant, or of a movement, e.g., ancient skepticism. See *Schedule of Classes* for name of philosopher or movement. May be repeated for credit for different philosophers and movements. Prerequisite: approval of instructor.

494 Special Topics. (1-4) F, S

In *Schedule of Classes*, title following course number indicates topic covered. Description of course materials is available in the departmental office. Prerequisite: approval of instructor.

498 Pro-Seminar. (1-3) F, S

Concentrated analysis of philosophical topics or of the works of a particular author. Prerequisite: approval of instructor.

591 Seminar. (1-3) F, S

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 Courses: PHI 484, 492, 493, 497, 499, 590, 592, 598, 599. (See pages 32-33.)

Physics

PROFESSORS:

WALKER (PS F-470), COWLEY, HANSON,
HESTENES, JACOB, KEVANE, KYRALA, LU,
MUNCH, NIGAM, PAGE, RAWLS, ROY,
STARRFIELD, STONER, STROJNIK, TILLERY,
WORK

ASSOCIATE PROFESSORS:

AANNESAD, ACHARYA, AHMADZADEH,
BENIN, KAUFMANN, LAWSON, MARZKE,
VOSS, WYCKOFF

ASSISTANT PROFESSORS:

LINDSAY, SPENCE, WOLLMAN

Departmental Major Requirements Bachelor of Science Degree Curriculum

Physics — Option No. 1. Designed for students who wish to pursue physics at the

bachelor or graduate degree level, this option consists of 45 semester hours of credit. Required courses are PHY 115†, 116†, 117†, 118†, 321†, 322†, 331†, 332†, 333†, 334†, 441†, 461†, and 465†. Additional courses in physics and other related fields will be selected with the approval of the advisor. Related courses will include MAT 290†, 291†, and 274†, 242† or 374†, 342†. MAT 270, 271, 272, may be substituted for MAT 290, 291. One year of credit in college level French, German or Russian is strongly recommended, particularly for the student who intends to pursue a graduate degree in physics.

Physics — Option No. 2. An interdisciplinary program designed for students who wish to obtain an undergraduate physics preparation for entry into other professions or graduate programs. Required are 54 semester hours of credit, at least 30 of which are in physics (PHY) courses including PHY 115†, 116†, 117†, 118†, 321†, 331†, 333† and 461†. The remaining courses will be selected from physics and an area of concentration as approved by the student's advisor. Examples of possible areas of concentration are physical chemistry, applied mathematics, geophysics, biological physics, philosophy of science, scientific journalism, etc., as well as pre-medical and pre-law programs. Related courses will necessarily include MAT 290†, 291†, and 274†, 242† or 342†, 374†. MAT 270, 271, 272 may be substituted for MAT 290, 291. One year of credit in a college level foreign language is strongly recommended for the student who wishes to pursue graduate studies in a discipline which has a foreign language requirement.

Astronomy. The astronomy faculty is a subgroup of the Physics Department. It offers General Studies courses in astronomy to the University community. Facilities of the Astronomy Group include a planetarium used for formal instruction and a roof-top observatory for student use.

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 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 and the Arizona Portal School Program. Other facilities include a planetarium used both for formal instruction and as a resource for schools in the area.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

General Science—Consists of 42 semester hours of credit. Required courses are CHM 113†, 231†; PHY 111†, 112†, 113†, 114†; BOT 100; ZOL 110; GLG 472; AST 321; PSE 460† or 480. Electives must be approved by the general science major advisor.

Physics—Option No. 1. Consists of 40 semester hours of credit. Required courses are PHY 111†, 112†, 113†, 114† (or 115†, 116†, 117†, 118†), 321†, 331†; PHY 460† or 361†; PHY 463† (2 hours). An additional nine hours in upper division physics (PHY) or physical science (PHS) 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.

Physics—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: PHY 111†, 112†, 113†, 114† (or 115†, 116†, 117†, 118†), 321†, 331†; PHY 460† or 361†; PHY 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 PHY 111†, 112†, 113†, 114† (or 115†, 116†, 117†, 118†); PHY 460 or 361†; one hour of PHY 463†. Remaining hours to complete the minor are selected from courses in physics, astronomy (upper division), and physical sciences (upper division) approved by the physics advisor.

General Science—Consists of 24 semester hours of credit. Required courses are MAT 117†; CHM 101 or 113†; PHY 101† (or 111†, 112†, 113†, 114†); AST 121 or 321;

BOT 100; ZOL 110; GLG 100 or 472. Remaining hours are selected with the approval of the minor field advisor.

Physical Science—Consists of 24 semester hours of credit. Required courses are MAT 117; CHM 101 or 113†; PHY 101† (or 111†, 112†, 113†, 114†); AST 121 (or 321, 322); GLG 100 or 472. 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 inter-departmental program leading to the Master of Natural Sciences degree.

Physics Department General Studies Courses for Non-Majors

All PHY, AST and PHS courses satisfy the General Studies science and mathematics requirement. The following courses presume no prior background in mathematics beyond high school algebra and geometry.

Physics: PHY 101

Astronomy: AST 121, 125, 321, 322

Physical Science: PHS 110, 361, 362, 370, 375, 380, 410, 411, 412, 413

PHYSICS

PHY 101 Introduction to Physics. (4) F, S
Emphasizes applications to life in the modern world. Understanding of elementary algebra is presumed. Three lectures, 1 recitation, 2 hours laboratory.

111, 112 General Physics. (3,3) F, S, SS
Noncalculus treatment of the principles of physics for nonphysics majors. Students whose curricula require a laboratory course must also register for PHY 113†, 114†. Prerequisite: trigonometry. Three lectures, 1 recitation.

113, 114 General Physics Laboratory. (1,1) F, S, SS
Elementary experiments in physics. May be taken concurrently with, or subsequent to PHY 111†, 112†, respectively. Two hours laboratory. Outside preparation for experiments and report writing are required.

115, 116 University Physics. (4,4) F, S, SS
Principles of physics using calculus. Prerequisite: Concurrent enrollment in MAT 290†, 291†, respectively, or equivalent. For physics laboratory at this level, enroll in PHY 117†, 118†. Four lectures, 1 recitation.

117, 118 University Physics Laboratory. (1,1) F, S
Introductory experiments, measurements and techniques in physics. Prerequisite: Credit or concurrent enrollment in PHY 115†, 116†. Two hours laboratory. Outside preparation for experiments and report writing are required.



251 Waves. (2) N

Vibrations and wave phenomena with applications to acoustics and optics. Propagation, reflection, refraction, interference and diffraction. Prerequisite: PHY 116†, or ECE 202†.

321 Newtonian Mechanics. (4) F

Vector calculus. Kinematics and dynamics of particles. Conservative, resistive and central forces. Dynamics of a charged particle. Many particle systems. The two body problem and collisions. Rigid body dynamics. Motion in noninertial reference frames. Prerequisites: PHY 116†; MAT 291† or equivalent; concurrent enrollment in MAT 242† and MAT 274† or equivalent.

322 Analytical Mechanics. (4) S

Lagrange's and Hamilton's equations. Constraints. Coupled oscillators. Elements of continuum mechanics; elasticity and hydrodynamics. Prerequisite: PHY 321†.

331 Electricity and Magnetism. (4) F

Vector fields and vector calculus. Electrostatic fields. Conductors and capacitors. Currents of charge; Ohm's law, charge conservation. Circuit theory. Magnetic fields and the Lorentz force. Electromagnetic induction. Fields in matter. Displacement current. Maxwell's equations. Prerequisites: PHY 116†; MAT 242† and 274†, or equivalent.

332 Electromagnetic Fields. (4) S

Maxwell's equations. Scalar and vector potentials. Laplace's equation and boundary value problems. Magnetostatics. Electromagnetic waves; propagation in media; reflection and refraction. Prerequisite: PHY 331†.

333 Intermediate Physics Laboratory I. (3) F, S

Basic physical measurements techniques with emphasis on modern electrical and electronic instrumentation. Prerequisites: PHY 117†, 118†, 321† (or approval of instructor; MAT 472 (or equivalent)). One hour lecture, 3 hours laboratory. Equivalent effort outside of the laboratory is required.

334 Intermediate Physics Laboratory II. (2) F, S

Experiments selected in consultation with instructors to suit the student's needs and interests. Prerequisites: PHY 331†, 333†. Three hours laboratory. Equivalent effort outside of the laboratory is required.

351 Optics. (3) F *80

Matrix methods in geometrical optics; interferometry, partial coherence, selective absorbers; Fresnel and Fraunhofer diffraction; Fourier transform spectroscopy. Prerequisites: PHY 116†; MAT 291† or 272†.

361 Modern Physics. (3) F, S

Special relativity and introductory quantum theory with applications drawn from atomic, nuclear and solid state physics. Prerequisite: PHY 116† or ECE 203†.

401, 402 Mathematical Methods in Physics. (3) F, S; Kaufmann

Elements of vector calculus, complex variables, ordinary and partial differential equations, integral transforms, special functions, determinants, matrices, probability and statistics. Prerequisite: PHY 321†.

434 Circuit Theory and Electronics. (4) N; Strojnik

Network theory, characteristics of nonlinear elements, vacuum tubes and transistors. Basic circuits and their applications in physical measurements. Prerequisites: PHY 331†, 334†. Three lectures, 3 hours laboratory.

441 Statistical and Thermal Physics I. (3) F; Marzke

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: PHY 321†, 331†.

442 Statistical and Thermal Physics II. (3) S; Marzke

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 fluctuation. Prerequisite: PHY 441†.

452 Advanced Optics. (3) S; Acharya

Linear systems theory, coherent and incoherent imaging, spatial filtering, elements of radio astronomy, antenna theory and heat flow problems, holography; coded apertures; reciprocity and symmetry in X-ray, electron and optical diffraction. Prerequisites: PHY 331†; 351†; PHY 401†, 402† recommended.

460 Elements of Atomic Physics. (3) F; Rawls

Electron and atomic physics. Designed for teachers and students not majoring in physics. Prerequisite: one year of college physics.

461 Modern Physics. (4) S; Ahmadzadeh

Special relativity, origin of quantum theory, the nuclear atom, elementary particles, introductory quantum mechanics, atomic and molecular spectra. Prerequisites: PHY 321†, 331†.

462 Nuclear Physics. (3) F; Ahmadzadeh

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: PHY 461†.

463 Physical Measurements. (1) S; Spence

Experiments in mechanics and heat, electricity and magnetism, optics and modern physics. Designed for teachers and students not majoring in physics. Prerequisite: PHY 112†. Three hours laboratory. May be repeated for a maximum of 3 hours credit.

465 Advanced Physics Laboratory I. (2) F, S

Continuation of PHY 334† at a more advanced level. Prerequisites: PHY 334†, concurrent enrollment in PHY 461† (or approval of instructor). Three hours laboratory. Equivalent effort outside of the laboratory is required.

466 Advanced Physics Laboratory II. (1-3) F, S; Spence

Continuation of PHY 465. Prerequisites: PHY 465†, 461†. May be repeated for credit.

471 Quantum Mechanics. (3) F; Jacob

Wave mechanics. Schrödinger's equation, barrier problems, operators and eigenfunctions, harmonic oscillator, one-electron atoms. Prerequisites: PHY 322†, 461† or approval of instructor.

472 Quantum Mechanics. (3) S; Jacob

Matrix mechanics, angular momentum, perturbation theory, scattering theory. Prerequisite: PHY 471† or approval of instructor.

480 Methods of Teaching Physics. (3) S; Rawls

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.

481 Solid State Physics. (3) S; Hanson

Structure, elastic properties and dynamics of crystals; electron motions in crystals under applied fields. Prerequisite: PHY 471†.

495 Project Research. (1-3) F, S; Work

Supervised project in experimental physics. Prerequisite: four hours selected from PHY 333†, 334†, 453† and 465†. May be repeated for credit. *Note: approval of*

120 PHYSICS

faculty member under whose direction the work is to be done must be obtained before registration.

501, 502 Methods of Theoretical Physics. (3,3) F, S; Kyrala

Provides mathematical foundations for graduate students in basic and applied physics. Complex variables, vector spaces, operators, matrices, ordinary differential equations, integral equations and transforms and special functions. May include additional topics. Prerequisites: PHY 401†, 402† or approval of instructor.

503 Physical Applications of Group Theory. (3) N; Page
Fundamentals and applications of the theory of finite and continuous groups as they occur in physics. Atomic, molecular, solid state and elementary particle physics. Prerequisite: approval of instructor.

510, 511 Astrogeophysics. (3,3) F, S; Kyrala
Physical properties of the structures and systems of the universe from the galaxies and stars to the interiors of the planets. Prerequisites: PHY 322†, 332† or approval of instructor.

521 Classical Mechanics. (3) F; Benin
Variational principles, Lagrange's and Hamilton's equations; rigid body motion; canonical transformations; Hamilton-Jacobi theory. Prerequisite: PHY 321†.

522 Advanced Topics in Classical Mechanics. (3) S; Benin
Continuum mechanics; elements of hydrodynamics; elasticity theory; special relativity. Prerequisite: PHY 322†, 521†.

523 Relativity. (3) N; Hestenes
Special and general theories of relativity. Prerequisites: PHY 522†, 532† or approval of instructor.

531 Advanced Electricity and Magnetism. (3) F; Page
Electrostatics and magnetostatics. Potential theory; theory of constitutive relations. Maxwell's equations. The wave equation; plane electromagnetic waves; cavities and wave guides. Prerequisite: PHY 331†, or approval of instructor.

532 Electrodynamics. (3) S; Page
Special theory of relativity; covariant formulation of electromagnetic interactions. Inhomogeneous wave equations; Lienard-Wiechert potentials, radiation fields. Interactions of charged particles and electromagnetic waves; scattering; dispersion. Prerequisites: PHY 332†, 531† or approval of instructor.

541 Statistical Physics. (3) F; Lu
Probability theory and principles of statistical inference. Evaluating experimental data; foundations of statistical mechanics. General laws of thermodynamics from microscopic theories. Calculation of specific properties of bulk matter. Prerequisites: PHY 441†, 471† (442† desirable).

542 Advanced Topics in Statistical and Thermal Physics. (3) S; Lu
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; hydrodynamics from many-body theory; phase changes and equilibrium; ferromagnetism. Prerequisite: PHY 541†.

551 X-Ray and Electron Diffraction. (3) S; Cowley
Fresnel and Fraunhofer diffraction in integral formulation. Diffraction of X-rays and neutrons by crystal lattices. Structures of solids, including crystal structure analysis. Theory and techniques of electron microscopy/diffraction of crystalline/noncrystalline specimens. Prerequisites: PHY 451†, 481† or approval of instructor.

561, 562 Nuclear Physics. (3,3) F, S; Roy
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: PHY 462†, 576† or approval of instructor.

564 Molecular Spectra and Structure. (3) N; Walker
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: PHY 471†.

568 Elementary Particle Physics. (3) N; Ahmadzadeh
Classification of particles; phenomenology of strong, electromagnetic and weak interactions, cross sections, decay rates; isotopic spin and higher symmetries; structure of reaction amplitudes. Prerequisite: PHY 577†.

569 Elementary Particle Theory. (3) N; Ahmadzadeh
Theoretical models for strong, electromagnetic and weak interactions; analytic-S-matrix, dispersion relations; current algebras; medium and high energy models. Prerequisite: PHY 568†.

576, 577 Quantum Theory. (3,3) F, S; Nigam
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: PHY 471†, 521†.

578, 579 Relativistic Quantum Theory. (3,3) F, S; Ahmadzadeh
Relativistic one-particle equations, Klein-Gordon equation, Dirac equation, second quantization, theory of scattering, S-matrix, Feynman diagrams, quantum electrodynamics, renormalization procedures. Prerequisite: PHY 577†.

581 Solid State Physics. (3) F'81; Page
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: PHY 481†, 472†, 576† (or concurrent enrollment).

582 Solid State Physics. (3) S'82; Page
Elements of transport theory, thermal conduction, electronic conduction in metals, mobility in semiconductors, Hall effect, magnetoresistance and selected topics of current research. Prerequisite: PHY 581†.

595 Current Physics Literature. (1) N; Work
Weekly seminar to introduce the graduate student to current activity in physics through the contemporary literature. (May be repeated for credit.)

ASTRONOMY

AST 121 20th Century Astronomy. (3) F, S, SS
Earth as a planet, the solar system, stars, galaxies and cosmology. Intended for nonscience majors. Three lectures, observatory and planetarium experience.

125 Introduction to Observational Astronomy. (2) F, S
Telescope and interpretation of astronomical observations. Photographic and planetarium experience. Prerequisites: Understanding of elementary algebra and credit or concurrent enrollment in AST 121 or 321 or 322

or approval of instructor. One hour lecture, 2 hours laboratory. Outside preparation for experiments and report writing is required.

321 Discovering the Solar System. (3) F, SS

History of astronomy, astronomical instruments, coordinate systems, planets, sun and formation of the solar system. Prerequisite: elementary algebra. Three lectures, observatory and planetarium experience. Outside preparation for experiments and report writing is required.

322 Stars and the Universe. (3) S

Distance methods used in astronomy, stellar structure and evolution, interstellar, medium, galaxies, and cosmology. Prerequisite: elementary algebra. Three lectures, observatory and planetarium experience.

325 Intermediate Observational Astronomy. (1) N

Continuation of AST 125. Observations with telescopes, and use of photography in astronomy. Evening meetings. Prerequisite: AST 125. May be taken concurrently with, or subsequent to AST 321 or 322. Two hours laboratory. Outside preparation for experiments and report writing is required.

351 The Solar System. (3) N

Spherical and gravitational astronomy, planets, comets, origin of the solar system. Prerequisites: PHY 116†; MAT 242† and 274†.

352 Stellar Astronomy. (3) N

Stellar distance scales, photoelectric photometry, interstellar matter, stellar dynamics, binaries, variable stars, galaxies, and cosmology. Prerequisites: PHY 116†; MAT 242† and 274†.

421 Stellar Astrophysics. (3) N

The physics of stellar atmospheres, identification of stellar spectra, stellar structure and evolution. Prerequisites: PHY 321†; MAT 242† and 272†.

422 Interstellar Astrophysics. (3) N

Physics of the interstellar medium, gas and dust clouds, interstellar molecules, gaseous nebulae, magnetic fields, cosmic rays. Prerequisites: PHY 321†; MAT 242† and 274†.

PHYSICAL SCIENCE

PHS 110 Physical Universe. (4) S

The universe as a unit, stars, solar system, earth, and atoms. Nature of matter and energy. Three lectures, 2 hours laboratory. Outside preparation for experiments and report writing is required.

361, 362 Science and Man. (2,2) F, S

Effects upon man of his technological civilization and consideration of recent advances in both pure and applied physical sciences. PHS 361: mechanics, electromagnetic radiations and astronomy. PHS 362: geology, chemistry and nuclear energy. Courses may be taken in either order.

370 Ideas of Physics. (1-3) N

Relationships of physical concepts to other areas of knowledge. Recent offerings have been: (1) basic concepts in physics; relativity, complementarity, uncertainty, etc.; (2) current topics of research and public interest; (3) methods for developing and assessing new ideas. See *Schedule of Classes* and consult Physics Department for current titles and sectional offerings. May be repeated for credit.

375 The Energy Crisis. (2-3) F, S

Current problems in energy resources, production, consumption and conservation. No physics or mathematics prerequisites. Students registered for 3 hours will participate in a discussion group as well as attend lectures.

380 Strategy and Tactics in Science. (2-3) N

Basic principles and procedures for constructing scientific models. Conservation, symmetry, and causality principles. Isolation, control, and estimation of variables. Examples from science and application to everyday situations.

410 Origins of the Physical Sciences. (3) N

Origins of astronomy, chemistry, physics and mathematics in the cultures of Mesopotamia, Egypt, China and India.

411 Development of the Physical Sciences. (3) N

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.

SCIENCE EDUCATION

PSE 220 Physical Science for the Elementary Teacher.

(3) F, S, SS

Physical science concepts and processes based on recent elementary school science education curricula. Must be taken in sequence: PSE 220, 221. Three-day field study.

221 Biological Science for the Elementary Teacher. (3)

F, S, SS

Biology and earth science concepts and processes based on recent elementary school science education curricula. Must be taken in sequence: PSE 220, 221. Three-day field study.

460 Science in the Junior High School. (3) S

Important science areas suitable for the junior high school. Recent developments in curricula; laboratory techniques and processes of science are stressed.

480 Methods of Teaching Physical Science. (3) N

Methods of instruction, organization and presentation of appropriate topics in physical science. Prerequisites: SED 311, 15 hours of physical science or approval of instructor.

Special Courses: PHY, PHS, AST, PSE 294, 298, 484, 492, 493, 494, 497, 498, 499, 500, 580, 584, 590, 591, 592, 594, 598, 599, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 32-33)



Political Science

PROFESSORS:

McGOWAN (SS 410), ALISKY, HINK, HOLMES, JO, KAMINSKY, MASON, RICE, SIMON, WHITE

ASSOCIATE PROFESSORS:

BERMAN, DALGLEISH, McGAW, READER, WALKER, WATSON, WOLF, YOUNGBLOOD

ASSISTANT PROFESSORS:

DAGGER, KEATING, MERRILL, STOOKEY

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. One course is required from each of four fields: POS 110 or 300 in American politics; 150 or 160 in comparative politics and international relations; 101, 440, 441, 442, 443, 444, or 445 in political theory; and 301, 401, 431, 436, 437, or a course in political behavior approved by the head undergraduate advisor. At least 15 hours in political science must be selected from courses in the POS 400 series. Courses POS 311, 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; no more than one "D" grade in a lower division course may be counted in the major. (See Graduation Requirements, page 39.)

Latin American Studies Combined Degree Program. (See Interdisciplinary Studies, page 54)—Consists of the Bachelor of Arts degree requirements in political science. At least 30 upper division semester hours of the total program must be in Latin American content courses including 15 hours in political science and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required. A reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the

transcript as a Bachelor of Arts degree with a major in Political Science—Latin American Studies Emphasis.

Asian Studies Emphasis (see Interdisciplinary Studies, page 52)—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 Studies courses selected with the approval of the advisor. Fulfillment of these requirements will be recognized by a Bachelor of Arts degree with a major in Political Science—Asian Studies Emphasis.

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. One course is required from each of four fields: POS 110 or 300 in American politics; 150 or 160 in comparative politics and international relations; 101, 440, 441, 442, 443, 444, or 445 in political theory; and 301, 401, 431, 436, 437, or a course in political behavior approved by the head undergraduate advisor. At least 21 hours in political science must be selected from courses in the POS 400 series. Courses POS 311, 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; no more than one "D" grade in a lower division course may be counted in the major. (See Graduation Requirements, page 39.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Political Science—Consists of 45 semester hours of credit, 30 of which must be in political science and 15 in closely related fields. Six courses are required: POS 110 or 300; 150 or 160; 101, 440, 441, 442, 443, 444, or 445; 301, 401, 431, 436, 437, or a course in political behavior approved by the head undergraduate advisor; 411; and 480. Courses POS 311, 330 or 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; no more than one "D" grade in a lower division course may be counted in the major.

Departmental Minor Teaching Field Requirements

Political Science—Consists of 24 semester hours of credit in political science courses. Five courses are required: POS 110 or 300; 150 or 160; 101, 440, 441, 442, 443, 444, or 445; 301, 401, 431, 436, 437, or a course in political behavior approved by the head undergraduate advisor; and 411. POS 311 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; no more than one "D" grade in a lower division course may be counted in the major.

Departmental Graduate Programs

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

POLITICAL SCIENCE

Note: POS 101, 110, 120, 150, 160, 170 have some sections offered with discussions groups. Consult current *Schedule of Classes*.

POS 101 Political Ideologies. (3) F, S

Leading political ideas and belief systems, e.g., Marxism, liberalism, conservatism, theories of democracy, and alternative futures.

110 Government and Politics. (3) F, S

Major institutions of modern government and processes of individual and group political activity with emphasis on the American experience. Meets the federal government requirement for teacher certification. Not open to students with credit for POS 100 or 300.

120 Political Issues and Public Policy. (3) F, S

Contemporary social problems and political issues, particularly development of public policy.

150 Comparative Government. (3) F, S

Political institutions and processes in selected foreign countries: origins, strengths and weaknesses of contemporary political systems, political development.

160 Global Politics. (3) F, S

The nature of contemporary world politics through the study of both general theoretical topics and specific geographical areas.

170 Public Law. (3) F, S

Principal concepts, institutions, classifications and functions of law. The role of the courts and the impact of judicial decision-making on social change.

300 American National Government. (3) F, S

Powers, functions and agents of American political institutions. Meets the federal government requirement for teacher certification. Not open to students with credit for POS 110.

301 Empirical Political Inquiry. (3) A

Logic of political inquiry including research problems, concepts, hypotheses, theories, measurement, data collection and analysis.

311 Arizona Constitution and Government. (2) A

Constitution and government of the State of Arizona. Not open to students having credit for POS 411. Meets the Arizona government requirement for teacher certification. May not be counted for the major, teaching major or minor in political science.

330 Current Issues in National Politics. (3) A

Major issues facing national governments in the domestic field. May not be counted for the major or the teaching major in political science.

360 Current Issues in International Politics. (3) A

An analysis of major current problems in world politics. May not be counted for the major or the teaching major in political science.

401 Political Statistics. (3) A

Basic concepts in statistics as they facilitate the description, explanation, and prediction of social and political phenomena.

410 Urban Government and Politics. (3) A

Politics and administration of city and town government in the United States. Problems, forms and services of city government.

411 State Government. (3) A

Major problems of state government, including constitutional revision, governmental reorganization, legislative apportionment and other matters, especially Arizona government. Meets the Arizona government requirement for teacher certification.

412 Metropolitan Government and Politics. (3) A

Political process in the metropolis with an examination of governmental organizations and decision-making structures.

413 Legislative Process. (3) A

Lawmaking process followed in selected legislative bodies; composition of membership, organization, powers; impact of internal and external forces on legislation.

414 The American Presidency. (3) A

Office, role and power of the American Presidency in the American political system.

420 Introduction to Public Administration. (3) A

Role of the administrator in the political process with an examination of the basic concepts of bureaucracy.

422 Politics of Bureaucracy. (3) A

Bureaucracy as a political entity; internal dynamics of public agencies; the relationship between public agencies and other political entities.

423 Politics of Budgeting. (3) A

The policy process in budgeting; strategies used to influence this process and recent reforms in public budgeting.

124 POLITICAL SCIENCE

424 Regulatory Politics. (3) A

Development and implementation of governmental policies regulating business activity, e.g., anti-trust, consumer and environmental protection and labor relations.

425 Public Policy Development. (3) A

Relationships between policy development and administrative processes as affected by the various roles of legislative bodies, executive and administrative agencies.

426 Elements of Public Policy. (3) A

Each section may cover one of the following topics: consumer protection, natural resources, criminal justice, environmental protection, science and technology, or theories of public policy. May be repeated for credit when topics vary.

430 American Political Parties. (3) A

Development of the American party system. Party organization and functions.

431 Public Opinion and Propaganda. (3) A

Formation, expression and influence of individual and organized opinion on political institutions.

433 Interest Groups. (3) A

Examines how minority, corporate, labor, farm, consumer, environmental, health, education, and public interest groups, and single-issue movements influence governments.

434 Comparative Politics. (3) A

Political parties, pressure groups, elections, legislators and executives studied from a cross-national perspective. Effect on politics of differences in political culture and style and socio-economic attributes.

435 Modernization and Political Change. (3) A

Political and social problems associated with modernization. Empirical focus on one or more developing regions.

436 Electoral Behavior. (3) A

Voting behavior and the attitudes, perceptions and activities of the citizenry in the political process.

437 Political Socialization. (3) A

Process by which individuals acquire politically relevant information, values, attitudes, and behavior: consequences of socialization for society and the relationship between personality and politics.

438 Revolution and the Social System. (3) A

Causes and consequences of revolution. Identification of systemic structures and institutions conducive to radical and moderate patterns of conflict resolution.

439 Minority Group Politics in America. (3) A

Role of minority groups in American politics.

440 History of Political Philosophy I. (3) A

Western political philosophers and their theories to the 17th century.

441 History of Political Philosophy II. (3) A

Western political philosophers and their theories from the 17th to the 20th century.

442 American Political Thought. (3) A

Political theories and movements from the colonial period to the present.

443 Topics in Contemporary Political Theory. (3) A

Major problems and theories in contemporary political thought. May be repeated for credit when topics vary.

445 East Asian Political Thought. (3) A

Contemporary political ideas and theories in East Asia and the impact of Western, including Marxist, thought on the revolutionary process of China.

446 Problems of Democracy. (3) A

Issues and problems in democratic theory: e.g., the nature of democracy, majority rule, representation, equality, and the value of political participation.

448 East Asia. (3) A

A comparative analysis of the political modernization experiences of China and Japan, focusing on their differing reactions to the West.

449 The British Nations. (3) A

Examines such parliamentary systems as Great Britain, Ireland, Canada, Australia, and New Zealand.

450 Soviet Union. (3) A

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.

451 Eastern Europe. (3) A

Modernization, multi-ethnicity, elitism, bureaucracy, regionalism and rivalry in East Europe.

452 China. (3) A

Background of the Communist revolution, political processes and developmental problems in China from a comparative perspective.

453 South America. (3) A

Governmental institutions, political processes and developmental problems of the South American states.

454 Mexico. (3) A

Mexican federal, state and local governmental institutions.

455 Central America and the Caribbean. (3) A

Governmental institutions, political processes and developmental problems of the nation-states and dependent areas of Central America and the Caribbean.

456 Western Europe. (3) A

Structures and behavior of governmental institutions and political processes in selected countries of Western Europe.

457 Central Europe. (3) A

Structures and behavior of governmental institutions and political processes in Central Europe; East German, Swiss, West German and Austrian systems.

458 Southeast Asia. (3) A

Political background, governmental institutions, political dynamics and developmental problems of Southeast Asian nations.

459 Sub-Saharan Africa. (3) A

Governmental institutions and processes of politics south of the Sahara.

460 World Politics. (3) A

Theoretical examination of one or more aspects of international politics, e.g., foreign policy, negotiations, alliances, crises, wars, international systems.

461 American Foreign Policy. (3) A

United States in world affairs; foreign policy since World War I. Techniques in formulating American foreign policies.

462 International Relations of the Communist World. (3) A

Nature and objectives of foreign policy of the Communist camp, emphasizing Soviet foreign policy and the Sino-Soviet conflict.

463 Inter-American Relations. (3) A

Diplomatic relations among the Latin American states. Development of U.S. foreign policy toward Latin America.

464 American Defense Policy. (3) A
Problems and issues of the organization and control of the defense establishment of the U.S.

465 International and Regional Organizations. (3) A
Theory, development and practices of international and supranational organizations.

466 The Modern World System. (3) A
Historical and theoretical examination of core-periphery relations within the international political economy since the 16th century.

467 Comparative Defense Policy. (3) A
Problems and issues of the organization and control of effective defense establishments within the context of various political systems.

468 Comparative Asian Foreign Policies. (3) A
Foreign policies of the Asian states emphasizing their security relations and movements toward regionalism.

469 Imperialism and Dependence. (3) A
Theoretical and empirical examination of political-economic structures of dominance and subordination in 20th century international relations.

470 Law and Society. (3) A
Nature, purposes and sanctions of law; sources of law; private and public law; common and civil law. Courts and administration of justice.

471 Constitutional Law I. (3) A
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.

472 Constitutional Law II. (3) A
Development of the United States Constitution as reflected in decisions of the Supreme Court: Due process; equal protection of laws; individual rights; civil liberties.

473 Judicial Decision-Making. (3) A
Relationship of political culture, institutional roles and personal attributes and attitudes to judicial decision-making.

474 International Law. (3) A
Law of the nations as developed by custom and agreement and as exhibited in decisions of international and national tribunals.

480 Methods of Teaching Government. (3) A
Methods of instruction, organization and presentation of subject matter in political science. Prerequisites: SED 311† or concurrently, and 15 hours in political science or approval of instructor.

484 Internship. (1-6) A

494 Special Topics in Political Science. (3) A
Chosen from the various fields of political science.

498 Pro-Seminar. (3) A
Small group study and research for advanced students within their major area. Prerequisite: major in the department or approval of instructor.

501 Foundations of Political Action. (2) F; Staff (8 weeks)
Examines the creation and expansion of political issues, mobilization of publics, and relationships among legislators, bureaucrats and lobbyists in various policy sectors. Prerequisite: approval of instructor.

502 Political Evaluation. (2) F; Staff (8 weeks)
Examines the political and philosophical bases for the assessment of political action. Prerequisite: approval of instructor.

503 Applied Political Inquiry. (3) S; Staff
Basic research design, methods, and statistics applied to problems in various policy sectors. Prerequisite: approval of instructor.

591 Seminar. (3) A; Staff
(a) American Politics (c) Public Policy
(b) Global Politics (d) Political Theory

598 Topics. (3) A; Staff
(a) American Politics (c) Public Policy
(b) Global Politics (d) Political Theory

601 Advanced Experimental Research. (3) F; Staff
The implementation of experimental and quasi-experimental research designs as models of inquiry and as applied in political research, including laboratory techniques and topics in the analysis of variance. Prerequisite: POS 401 or equivalent.

602 Advanced Survey Research. (3) S; Staff
Problems in the design and conduct of political surveys, including sampling, instrument design, scaling, and statistical and graphical analysis of survey data. Prerequisite: POS 401 or equivalent.

603 Pollmetrics I. (3) F; Staff
Applications of the general linear model to topics in the estimation of single equation models of political phenomena including time-series analysis. Prerequisite: POS 401 or equivalent.

604 Pollmetrics II. (3) S; Staff
Continuation of POS 603, including techniques of simultaneous equation estimation and other multi-variate statistical techniques such as factor and discriminant analysis. Prerequisite: POS 603.

792 Research. (3) F, S
Projects in various areas of political science. Required of all, and open only to, doctoral students.

Special Courses: POS 492, 493, 499, 590, 592, 599, 790, 792, 799. (See pages 32-33.)



Psychology

The doctoral program of the Department of Psychology in clinical psychology is accredited by the American Psychological Association.

PROFESSORS:

KILLEEN (PYB-237C), BRAUN, CIALDINI, HAYGOOD, JONES, LANYON, LINDER, MEYERSON, PARKINSON, REICH, VESTRE

ASSOCIATE PROFESSORS:

BRAVER, CHARTIER, EISENBERG, FEHR, HOMA, LESHOWITZ, LEVINE, LINDHOLM, ROSSI, SADALLA, SANDLER

ASSISTANT PROFESSORS:

BARRERA, CHASSIN, GLANZMAN, KENRICK, SOMERVILLE, WOLCHIK, ZAUTRA, ZEISS

INSTRUCTOR:

RITCHIE

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 PGS 100, PSY 230†, 290†; one course from among PGS 315†, 341†, 350†; one course from among PSY 323†, 324†, or 325†; and at least two more upper-division courses. Required related courses are MAT 117† and 119†, or their equivalents, which students are encouraged to complete early in their college careers. (See Graduation Requirements, page 39.)

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 selected by the student in consultation with the advisor. Required courses in psychology are PGS 100, PSY 230† and 290†; one course from among PGS 315†, 341†, 350†; one course from among PSY 323†, 324†, or 325†; and at least two more upper-division courses. Required related courses are MAT 117† and 119†, or their equivalents; two semesters of physics, chemistry, geology or astronomy, and two semesters of biology, zoology, physiology, or microbiology. (See Graduation Requirements, page 39.)

Departmental Minor Teaching Field Requirements (Secondary Education)

Consists of 24 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 (PGS)

Courses which may be applied toward General Studies requirement in social and behavioral sciences.

PGS 100 Introduction to Psychology. (3) F, S, SS
Major areas of theory and research in psychology. Participation in department-sponsored research or an educationally-equivalent alternative activity is required.

270 Psychology of Adjustment. (3) F, S, SS
Principles of mental health, adjustment, conflict, stress and coping processes derived from clinical and experimental research. Prerequisite: PGS 100.

306 Environmental Psychology. (3) F, S, SS
Concepts and research strategies in the study of behavior in interaction with physical environment. Prerequisite: PGS 100.

310 Social Psychology and Mental Health. (3) F, S
Social and cultural influences on mental health and illness, emphasizing current issues and related research. Prerequisite: PGS 100.

315 Personality Theory and Research. (3) F, S, SS
Definition and description of personality in terms of theoretical and methodological approaches. Prerequisite: PGS 100.

331 Sexual Identification. (3) N
Theories and research in the development of sexual identification; concepts of femininity and masculinity; social roles and attitudes. Prerequisite: PGS 100.

332 Human Sexual Behavior (3) F, S
Sexual development, variations and deviations in sexual behavior, and sexual disorders. Prerequisite: PGS 100.

341 Developmental Psychology. (3) F, S
Behavior development analyzed in terms of psychological principles. Current research in human development. Prerequisite: PGS 100.

350 Social Psychology. (3) F, S, SS
Human social behavior including such concepts as aggression, attraction, attribution, conformity, groups, helping, person perception, and persuasion. Prerequisite: PGS 100.

371 Psychological Testing. (3) S
Methods and theory of psychological testing; various types of psychological tests; consideration of ethical, social, and legal aspects of testing. Prerequisites: PGS 100; PSY 230 or approval of instructor.

414 History of Psychology. (3) F, S
Historical development of psychology from its philosophical beginnings to the present. Prerequisite: PGS 100.

426 Clinical Psychology. (3) F, S

Clinical psychology as a science and profession. Historical development, methods of interviewing and assessment, and methods of therapeutic intervention. Prerequisite: senior status or approval of instructor.

427 Psychology of Aging. (3) N

Behavioral, attitudinal, and emotional phenomena associated with maturity and old age; analysis both of the positive abilities and resources which may be retained, as well as the stresses of dying, death, and grief. Prerequisite: PGS 100.

430 Industrial Psychology. (3) F,S,SS

Psychological contributions to the understanding of organizations and management systems. motivation and work performance, human factors in systems design and evaluation, and personnel selection and testing. Prerequisite: PGS 100.

441 Cognitive Development. (3) F,S

Experimental and theoretical literature in child development and behavior. Prerequisite: PGS 341†.

442 Life Span Development. (3) N

Methods and findings of recent studies of the development, growth and problems of adolescents and adults with implications for education. Prerequisite: PGS 341†.

443 Psychology of Exceptional Children. (3) F

Behavior of children classed as exceptional, in relation to the problems of assessment, treatment and education. Mental deficiency, habit disturbances, speech disorders, learning disabilities, psychophysiological disorders. Prerequisite: PGS 341† or approval of instructor.

444 Directed Child Study. (1-3) F, S, SS

Supervised experience with children in the pre-school program of the Child Study Laboratory. Prerequisites: CDE 232† or PGS 341† and approval of instructor. May be repeated for a total of 9 credits.

458 Group Dynamics. (3) F

Theories and methods of group leadership, group effectiveness, communication within groups and relations between groups and individual members. Prerequisite: PGS 350†.

459 Attitudes and Attitude Change. (3) S

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: PGS 350†.

466 Abnormal Psychology. (3) F, S, SS

Historical and current definitions, theory, and research concerning abnormal behavior. Major categories of psychopathology including related treatment approaches. Prerequisite: PGS 100.

Special Courses: PGS 494, 498, 584, 590, 592, 599, 700, 790, 791, 792, 799. (See pages 32-33.)

PSYCHOLOGY (PSY)

Courses which may be applied toward the General Studies requirement in sciences and mathematics.

PSY 212 Experimental Analysis of Behavior. (4) F, S
Basic principles of behavior analysis, with emphasis on the control and modification of human behavior. Course is self-paced; includes a laboratory.

230 Introduction to Statistics. (3) F, S, SS
Basic concepts in descriptive and inferential statistics,

emphasizing applications to psychology. Prerequisite: PGS 100; MAT 117† is recommended. The course has both self-paced (PSI) and lecture sections.

290 Experimental Psychology. (4) F, S

Planning, execution, analysis and reporting of behavioral experiments. Literature, procedures and instruments in representative areas of psychological research. Required for psychology majors. Prerequisite: PSY 230† or equivalent. Three lectures, 3 hours laboratory.

323 Sensation and Perception. (3) F, S

Underlying processes of vision, audition and the other senses. Application of current research and theory in a laboratory environment. Prerequisite: PSY 290† or approval of the instructor.

324 Learning and Memory. (3) F, S

Processes underlying information storage and retrieval, including different kinds of memory, forgetting, depth of processing, and control processes. Prerequisite: PSY 290† or approval of instructor.

325 Physiological Psychology. (3) F, S, SS

Relationships of physiological processes to behavior. Emphasis is on nervous system functioning. Prerequisites: PGS 100, or two courses in biological science, preferably both, PSY 290† or approval of instructor.

330 Statistical Methods. (3) S

Advanced application of statistics to psychology. Highly recommended for students interested in attending graduate school. Prerequisite: PSY 230†. Three lectures, 1 hour laboratory.

399 Independent Study. (1-3) F, S, SS

Design and execution of original research projects under faculty supervision. Prerequisite: approval of instructor. May be repeated for a total of 6 hours.

420 Radical Behaviorism. (3) S

Research, applications, and philosophy of the control of human and animal behavior, from the Skinnerian perspective. Prerequisite: PSY 212 or 290†.

423 Animal Behavior. (3) N

Generality of behavioral laws throughout the animal kingdom, as well as behavior patterns specific to different species. Prerequisite: upper division standing.

425 Biological Bases of Behavior. (3) N

Critical study of physiological psychology; brain mechanisms underlying motivation, learning, etc. Prerequisite: PSY 325†.

426 Neuroanatomy. (4) S

Structure and function of mammalian brain including sheep brain dissection. Prerequisite: upper division standing. Three lectures, 3 hours laboratory.

434 Cognitive Psychology. (3) F

The human organism as a processor of information, from perception to cognition: abstract concepts, semantic memory, attention, and mental imagery. Prerequisite: approval of instructor.

490 Course Programming. (2) F, S, SS

Supervised experience in the development and administration of programmed instruction. Designed for students who proctor self-paced or personalized courses. May be repeated for a total of 4 credits. Prerequisite: approval of instructor.

498 Pro-Seminar. (3) F, S

Offerings will be selected from topics of current interest in psychology.

128 PSYCHOLOGY

499 Independent Study. (1-3) F, S, SS

Design and execution of original research projects under faculty supervision. Prerequisite: PSY 399 and approval of instructor. May be repeated for a total of 6 hours.

501 Supervised Teaching. (4) F

Experience in and examination of perspectives on teaching undergraduate psychology. Prerequisites: graduate standing in Psychology and approval of instructor.

505 Theoretical Foundations of Social Psychology. (3) S

Major research topics and paradigms in social psychology. Systematic developments in theory and research. Group processes, attitude formation and change, and social perception. Prerequisite: approval of instructor.

506 Survey of Research in Environmental Psychology. (3) F

Major topics and paradigms in the study of man-environment relationships.

507 Research Methods in Environmental Psychology. (3) S

Techniques of investigation in environmental psychology. Prerequisite: approval of instructor.

512 Advanced Learning. (3) N

Principles and theories of learning, emphasizing research literature.

514 History of Psychology. (3) F

Historical development of psychology as a science and a profession from its philosophical beginnings to contemporary times, including current issues. Prerequisite: PGS 100.

520 Advanced Experimental Analysis of Behavior. (3) N

Contemporary research literature in the experimental analysis of behavior. Prerequisite: PSY 420†.

522 Methods and Instrumentation in Psychological Research. (3) N

Electronic and electromechanical instrumentation in psychological research, including training in the programming and use of real time computers. Prerequisite: approval of instructor.

524 Advanced Physiological Psychology. (3) N

Contributions of physiological processes and brain function to fundamental behavioral processes.

528 Sensation and Perception. (3) N

Principles of sensory and perceptual processes, emphasizing research literature.

529 Correlation and Psychometric Theory. (3) S

Principles of correlational techniques, including regression and multiple correlation. Psychometric theory, including reliability, and validity.

530 Intermediate Statistics. (3) F

Continuation of PSY 529. Psychological statistics, emphasizing the analysis of variance and the design of experiments.

534 Information Processing. (3) S

Processes by which sensory input is transformed, reduced, elaborated, stored, recovered, and used.

535 Cognitive Processes. (3) N

Theoretical/empirical treatment of the human organism as a processor of information, including abstraction, memory structure, problem solving, and thinking.

540 Advanced Developmental Psychology. (3) N

Theory and methodology pertaining to the study of children, emphasizing research findings and their implications. Prerequisite: admission to Psychology Ph.D. program or approval of instructor.

550, 551 Advanced Social Psychology. (3, 3) F, S

Theory and research concerning interpersonal perception, decision-making, attitude formation and change, group processes, social motivation, and interaction processes. Prerequisite: PSY 505† or approval of instructor.

553 Social Influence. (3) N

Research literature relevant to attitude formation and change, conformity, obedience, power, compliance and altruism. Prerequisites: PSY 550†, 551†, or approval of instructor.

555 Research Methods in Social Psychology. (3) S

Review of research techniques. Laboratory and field research analyzed; applications to specific topics. Prerequisite: approval of instructor; PSY 505†.

556 Social Perception. (3) N

Attribution theory, attraction, cognitive organization, impression formation, social judgment, scaling procedures for social stimuli. Prerequisites: PSY 550†, 551†, or approval of instructor.

558 Interpersonal Processes. (3) N

One or more topics chosen from: empathy, modeling, vicarious processes, contagion, group phenomena, social communication, behavior exchange. Prerequisites: PSY 550†, 551†, or approval of instructor.

564, 565 Somatopsychology. (3, 3) F, S

Theory and research in the psychological aspects of chronic illness, physical disability, and mental retardation.

569 Advanced Study of Personality. (3) N

Personality as a theoretical concept in psychology, including definitional problems, behavioral and traditional approaches, the measurement of personality, and current research issues. Prerequisite: approval of instructor

571 Intellectual Assessment. (3) F

Theory and research on assessment of intelligence and the development of intelligence tests. Supervised practice in a self-paced instructional format. Prerequisite: admission to clinical Ph.D. program or approval of instructor.

572 Personality Assessment. (3) S

Theory and research on assessment of personality and psychopathology and construction of personality assessment instruments. Supervised practice in a self-paced instructional format. Prerequisite: admission to clinical Ph.D. program or approval of instructor.

573 Psychopathology. (3) F

Theory and research relating to the contribution of psychological, social, physiological, and genetic factors to the development and persistence of abnormal behavior. Prerequisite: admission to Psychology Ph.D. program or approval of instructor.

574 Psychotherapy. (3) S

A detailed survey of the theoretical and empirical literature relating to verbal psychotherapy and interviewing methods. Structured role-playing practice in the major procedures. Prerequisite: admission to the clinical Ph.D. program or approval of instructor.

575 Behavior Therapy. (3) F

Theory and research relating to the use of behavior therapy in modifying abnormal behavior. Structured practice. Prerequisite: admission to the clinical Ph.D. program or approval of instructor.

576, 577 Clinical Practicum. (3, 3) F, S

Supervised experience in development of professional skills in clinical psychology including the application of assessment procedures, psychotherapy, and behavior therapy techniques with children and adults, and consultation. Prerequisite: admission to clinical Ph.D. program.

579, 580 Community Psychology Practicum. (3, 3) F, S

Supervised experience in conceptualizing, conducting and evaluating psychological interventions to promote well-being in community settings. Advanced theory and research as relevant. Prerequisite: PSY 582 and advanced standing in psychology Ph.D. program or approval of instructor.

581 Advanced Clinical Assessment. (3) N

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.

582 Community Psychology. (3) SS

Community systems, intervention techniques, consultation models, history and current status of community mental health movement, conceptualization of the roles of community psychologists in social system intervention. Prerequisite: advanced standing in Psychology Ph.D. program or approval of instructor.

583 Child Psychopathology. (3) N

Major theories and research related to the development of deviant behaviors in children, including some supervised experience in child assessment. Prerequisites: PSY 571†, 572†, or approval of instructor.

584 Advanced Treatment Methods. (3) N

Advanced theory, research, and techniques of psychological treatment methods. Prerequisites: PSY 576†, 577†, and approval of instructor.

586, 587 Advanced Clinical Practicum. (3, 3) F, S

Supervised experience directed toward the development of specialized professional skills in clinical psychology in one of the following areas (individual psychotherapy, group therapy, marital therapy, family therapy, or child psychotherapy). Prerequisites: PSY 576†, 577†, and approval of instructor.

588 Consultation Methods. (3) N

Several theories and strategies of organizational consultation. The development of consultational skills through simulation and practical experience. Prerequisite: advanced standing in Psychology Ph.D. program or approval of instructor.

589 Social Learning Theory. (3) N

Social-learning approach to the study of adaptive and maladaptive behavior patterns, including theoretical and empirical research foundations of behavior therapy strategies. Prerequisite: admission to Psychology Ph.D. program or approval of instructor.

591 Seminar. (3) F, S, SS

Special Courses: PSY 484, 494, 584, 590, 592, 599, 700, 790, 791, 792, 799. (See pages 32-33)

Religious Studies

PROFESSORS:

BROWN (LL B-605), WENTZ

ASSOCIATE PROFESSORS:

GILL, MARTIN

ASSISTANT PROFESSORS:

FOARD, GEREBOFF, RADER

Departmental Major Requirements**Bachelor of Arts Degree Curriculum**

The major in religious studies consists of 45 semester hours of credit. Thirty hours must be in religious studies, including 21 upper division hours, and 15 hours in related fields to be determined by the student in consultation with his or her advisor. The religious studies curriculum is divided into several subject fields: Near and Middle Eastern Religious Traditions; Western Religious Traditions; Eastern Religious Traditions; Religion in America; Contemporary Religious Thought; Native American Religious Traditions; Religious Literature (e.g., *Bible*, *Talmud*); History of Religions; Ethics, Society and Culture. For the major, 12 credits are required in one field and 18 credits in at least three other fields. A minimum grade point average of 2.5 is required in the 30 hours of religious studies courses.

Departmental Graduate Program

The Department of Religious Studies offers programs leading to the degree of Master of Arts for those who wish to seek the Ph.D. in the study of religions, or who wish to teach at the community college level, or for those in non-academic careers who desire general competence in the academic study of religions. Consult the *Graduate Catalog* for requirements.

RELIGIOUS STUDIES**REL 121 Religions of the World.** (3) F, S

An introduction to religious traditions of the world, including Buddhism, Hinduism, Islam, Judaism, Christianity and others.

122 Ways of Being Religious. (3) A

Comparison of various religious expressions of mankind, focusing on such themes as encounter with the Holy, man's search for self and for community, mystical illumination through spiritual freedom and discipline.

130 RELIGIOUS STUDIES

211 Introduction to Judaism. (3) A

The beliefs, ceremonies, festivals and institutions of Judaism emphasizing the contemporary era. The course presupposes no previous knowledge about Judaism.

212 Introduction to Christianity. (3) A

The beliefs, ceremonies, festivals and institutions of Christianity, emphasizing the contemporary era. The course presupposes no previous knowledge about Christianity.

305 Ritual, Symbol and Myth. (3) A

Ritual, symbol and myth as types of religious expression with examples selected from the religions of the world.

311, 312. Western Religious Traditions. (3, 3) A

Religious traditions of ancient Persia, Mesopotamia and Egypt, and the rise of Judaism, Christianity and Islam, including the influence of such movements as Gnosticism, the Mysteries, and Hellenism.

314 Formation of the Christian Tradition. (3) A

Origins, development and expansion of Christianity; major themes and tensions from the New Testament world to the beginning of the Middle Ages.

316 Types of Early Judaism. (3)A

Developments in Judaism during the inter-testamental period.

317 Introduction to Rabbinic Judaism. (3) A

An historical analysis of the thought, literature, and institutions of rabbinic Judaism.

321 Religions in America. (3) F,S

The emergence of religious pluralism in America. The rise of denominationalism and of the variety of religious traditions in the course of American history.

322 Religion in American Life and Thought. (3) F,S

The role of religion in American history. Functions, contributions, tensions, and perspectives of religion in American culture.

330, 331 Native American Religious Traditions. (3, 3) A

World views and religious thought presented through the art, architecture, literature, music, mythology, ritual and folklore of representative tribes in North America.

341 Contemporary Religious Thought. (3) A

Issues in current Western religious thought, such as theology and revolution, Judaism and Christianity, the impact of science on religion, the "death of God" controversy, the Bible and tradition.

351 Hinduism and Buddhism. (3) A

Introduction to Hinduism through readings in the Vedas, Upanishads, and Bhagavad Gita. Buddhism from its origins in India through the development of the Mahayana in China and Japan.

352 Confucianism and Taoism (3) A

Issues in classical Chinese religious thought. Readings include Confucius, the *Tao Te Ching*, Mencius, Chuang Tzu, and the *I Ching*.

365 Islamic Civilization. (3) A

An interdisciplinary survey of the art, history, and religion of Islamic civilization.

370 Hebrew Bible (Old Testament). (3) S

The nature, content, background, historical situation and message of the books of the Hebrew Bible, in English translation.

371 New Testament. (3) F

Origins and literature of early Christian communities; historical investigations of the types of oral and written tradition in the New Testament.

374 Classics of Christian Literature. (3) N

The interaction of Christian thought and culture as seen in representative Christian literature of various ages (early Christian to contemporary).

381 Religion and Moral Issues. (3) A

The manner in which human religiousness relates to social concerns; e.g., sexuality, the environment, bioethical issues, and violence.

390 Women and Religion (3) A

The role of women in several organized religions and/or religious sects, including a study of myth and symbols as they are used to establish, maintain, and enforce sex-roles within specific religions.

405 Problems in the History of Religions. (3) A

An in-depth consideration of selected problems in the history of religions, e.g., ritual as creative process, interpretation of mythology, initiation, crisis cults.

411 Religion in the Middle Ages. (3) A

Religious aspects of medieval life and thought; variety of forms of dissent, heresy, and reform movements (4th to 13th centuries).

412 Reformation and Modern Christianity. (3) A

Protestant Reformation to contemporary Christian movements; includes factors in the dissolution of the Medieval Christian synthesis, variety of reform movements and reformation patterns, Catholic counter-reform measures, formation of liberal theology, ecumenical movement, World Council of Churches.

415 The Jewish Mystical Tradition. (3) A

Examination of some of the esoteric lore of Judaism. Movements and literature such as Hasidism and Kabbalah will be studied.

425 American Sects and Cults. (3) N

The emergence of sectarian and cultic religious life. The heritage of dissent. The "new" religions in the light of American religious history. Prerequisite: REL 321 or 322 recommended.

426 American Preachers and Preaching: The Sermon in America. (3) N

The life and work of notable American preachers. The emergence of the preacher as representative of American religion. Prerequisite: REL 321 or 322 recommended.

427 American Religious Thought. (3) N

The thought of representative American religious thinkers, i.e., Jonathon Edwards, William Ellery Channing, Horace Bushnell, and Reinhold Niebuhr. Prerequisite: REL 321 or 322 recommended.

430 Native American Mystical Traditions. (3) A

Consideration of Native American mystical practices such as shamanism, vision quest, dreaming, divination, and the use of medicines and drugs such as peyote

435 Problems in Native American Religions. (3) A

An in-depth consideration of selected problems in Native American religions.

441 Process Theology. (3) N

The impact of modern process philosophies on current religious thought. Emphasis on the use of A.N. Whitehead's philosophy in the rethinking of traditional Christian concepts, Catholic and Protestant.

442 Existentialist Theology. (3) N

The contribution of existentialist thinkers, especially Kierkegaard, to the work of theologians such as Martin Buber, Rudolf Bultmann, and Paul Tillich.

445 Judaism in Modern Times. (3) A

Variety of expressions of Judaism and Jewishness in the modern period. Topics may include American Judaism or religious responses to the Holocaust.

451 Religions of India. (3) A

The religions of India through its institutions, literature, folklore, art, and architecture.

453 Zen. (3) A

History, practices and cultural influence of Zen (Ch'an) Buddhism in China and Japan.

454 Hindu Religious Thought. (3) A

Readings in classical systems such as Samkhya and Vedanta, and in the works of modern Hindus such as Aurobindo and Gandhi. Prerequisite: REL 351 recommended.

455 Religion in Japan. (3) A

Role of religion in Japanese history and culture. Emphasis on the impact of Buddhism and its transformation in Japan, the vitality of folk religion, the intimacy of religion and the arts, the ideals of the samurai and religion in modern Japan.

460 The Religious Tradition of Islam. (3) A

The Islamic religious tradition from the time of the Prophet down to the present day. Major religious figures, practices, institutions and movements will be examined.

464 The Sufi Way. (3) S

Asceticism, mysticism, and illuminationism in Islam. Focus on representative Sufi saints, their systems and modes of expression.

494 Special Topics in Religious Studies. (3) N

Open to all students, freshmen by approval of instructor only. Topics may be selected from various areas.

498 Pro-Seminar in Religious Studies. (3) N

For students with a major or minor emphasis in Religious Studies.

522 Political Religion in America. (3) N

Investigation of the relationship between American religion and the political process. Such topics as civil religion, millennialism, and American destiny will be examined. Prerequisite: REL 322.

591 Seminar. (3) S; Staff

Topics on methodological issues in the study of religion. Prerequisite: Religious Studies graduate student or approval of instructor.

598 Special Topics. (3) F, S; Staff

May be repeated for credit. Topics are selected from the following areas:

- (a) Religion in America
- (b) Native American Religions
- (c) History of Christianity
- (d) Judaic Studies
- (e) Contemporary Religious Thought
- (f) Islamic Studies
- (g) Religious Traditions of India
- (h) Religious Traditions of the Far East
- (i) Religious Ethics
- (j) History of Religions

Special Courses: REL 294, 298, 492, 493, 497, 499, 584, 590, 592, 594. (See pages 32-33).



Sociology

PROFESSORS:

GORDON (SS 321), AXELROD, FARBER, HOULT, HUDSON, LINDSTROM, MAYER, OWEN, SEBALD

ASSOCIATE PROFESSORS:

ALTHEIDE, COBAS, HARDERT, JOHNSON, LANER, NAGASAWA, PFUHL, SNOW, WHITAM

ASSISTANT PROFESSORS:

McPHERSON, NIGG, SMITH, SULLIVAN, WEITZ

Departmental Major Requirements

Bachelor of Arts and Bachelor of Science Degree Curricula

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 B.A. and B.S. degrees. 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 SOC 101 or 301, 390†, 391†, 483† or 485† or 486† and 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. (See Graduation Requirements, page 39.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Sociology Consists of 63 semester hours of credit of which 30 hours must be in sociology and are exactly those courses required for the Bachelor of Arts or Bachelor of Science degree in sociology. Of the remaining hours, two groups of 12 hours each and one of 6 hours are generally taken in related social sciences plus SED 480†.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Sociology—Consists of 24 semester hours of credit, at least six of which will be upper divi-

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sion. SOC 101 or 301 is required. The remaining 21 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).

Special Emphasis Program

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 SOC 340†, 360†, 440†, 446†, 449†, and SWU 470† in addition to SOC 101, 390†, 391†, 483† or 486† or 485†. 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 recognition by a statement on the student's transcript.

Departmental Graduate Programs

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

SOCIOLOGY

SOC 101 Introductory Sociology. (3) F, S, SS
Fundamentals of sociology, organization of human groups and society, processes of interaction and social change. Not open to students who have credit for SOC 301. Two hours lecture, one hour discussion.

251 American Society. (3) S
Systematic analysis of the major institutions of economic activity, political structure, science, education and religion in contemporary America. Prerequisite: SOC 101.

301 Principles of Sociology. (3) F, S, SS
Intensive and critical analysis of the concepts of sociology. Not open to students who have credit for SOC 101.

305 Courtship and Marriage. (3) F, S, SS
A functional approach to marriage: courtship, engagement, marital adjustment.

332 The Modern City. (3) F, S
Growth, characteristics and problems of the modern city. Prerequisite: SOC 101 or 301.

333 Population Problems. (3) F, S, SS
Theories of population change: births, deaths, migration, population policies. Prerequisite: SOC 101 or 301.

340 Sociology of Deviant Behavior. (3) F, S, SS
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: SOC 101 or 301.

341 Modern Social Problems. (3) F, S, SS
Race relations, poverty, unemployment and other current issues.

348 Overview of Aging. (3) F
Multidisciplinary introduction to gerontology. Explores the characteristics, experiences, problems, and needs of older persons.

351 Industrial Sociology. (3) S
Social and cultural analysis of industry. Occupational roles, status and social participation of workers. Prerequisite: SOC 101 or 301.

352 Social Change. (3) F, S
Patterns of social change, resistance to change and change-producing agencies and processes. Prerequisite: SOC 101 or 301.

360 The Social System and the Individual. (3) F, S
Interaction patterns between the sociocultural order and individuals; socialization process; norms, roles and statuses; collective behavior. Prerequisite: SOC 101 or 301.

362 Sociology of Adolescence. (3) F, S
Cultural values and the social processes that help explain the development of the phenomenon of modern adolescence, including investigation of adolescent subcultures and cross-cultural references. Prerequisite: SOC 101 or 301.

365 The Sociology of Mass Communication. (3) F, S
A sociological exploration of the major mass media as a communicative process in American society.

390 Social Statistics. (3) F, S, SS
Application of descriptive and inferential statistical methods to research problems in sociology. Prerequisites: SOC 101 or 301 and passing a proficiency examination in basic algebra to be administered by the Department of Sociology, or approval of instructor. MAT 106† recommended.

391 Sociological Research. (3) F, S, SS
Methods of sociological research, including the fundamental assumptions underlying research and some practical experience in: research design, data collection techniques and data analysis. Prerequisites: SOC 101 or 301, 390† or approval of instructor.

392 Practicum in Survey Research I. (3) F
Provides practical experience in conducting a significant research project—survey design, questionnaire construction, sampling, data collecting, coding and preliminary data processing. Prerequisite: SOC 391† or approval of instructor.

393 Practicum in Survey Research II. (3) S
Continuation of SOC 392. Provides practical experience in analysis and reporting survey data. Prerequisite: SOC 392†.

401 Comparative Sociology. (3) F, Cobas
Cross-cultural study of basic social institutions; methodology of cross-cultural research; case studies of three or four different societies, concentrating on one other than the United States. Prerequisites: six hours in sociology including SOC 101 or 301, or ASB 102, or approval of instructor.

410 Sociology of Religion. (3) S, Owen
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 SOC 101 or 301, or approval of instructor.

415 The Family. (3) F. S. SS: Farber, Hudson
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 SOC 101 or 301, or approval of instructor.

416 Marriage Problems in Contemporary Society. (3) S: Hudson
Marital and family problems in today's society from the viewpoint of personal and cultural adjustment. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

417 Family Violence. (3) F: Johnson
Current research and theory on child abuse, neglect, sexual exploitation, and maltreatment; also spousal abuse and violence; intervention; policies.

432 Human Ecology. (3) F. S: Sullivan
Patterns and laws of societies' adjustments to the physical environment; distribution of communities and institutions. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

433 Demography. (3) S: Lindstrom, Sullivan
Science of population analysis; problems in measurements of the size, composition and changes in population. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

440 Racial and Ethnic Minorities. (3) F. S. SS: Gordon
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 SOC 101 or 301, or approval of instructor.

446 Sociology of Crime. (3) F: Pfuhl
The process of criminalization, exploring the behavior of the definers of crime and the behavior of those defined as criminals. Prerequisites: SOC 101 or 301 and 340†, or approval of instructor.

448 Sociology of Aging. (3) F. S: Laner
Social aspects of aging. Theoretical and methodological perspectives, problems of aging such as life satisfaction, retirement and adjustment to role loss. Prerequisite: SOC 101 or 301 or approval of instructor.

449 Sociology of Law. (3) S: Pfuhl
Examination of law as an institution; its origins, operations, and consequences. Emphasis on contemporary legal issues and problems. Prerequisite: SOC 446† or approval of instructor.

452 Sociology of Complex Organizations. (3) F
Sociological studies of government agencies, industrial firms, labor unions, military establishments and other large-scale organizations. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

453 Social Class and Stratification. (3) S: Staff
Social classes and the function of these groupings in a society. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

454 The Afro-American in Modern Society. (3) S: Staff
Social and cultural heritage of Black Americans; achievements and current trends. Prerequisite: approval of instructor.

455 Collective Behavior. (3) S: Gordon
Social causes and consequences of such non-institutionalized forms of behavior as crowds, cults, pub-

lics, social movements and revolutions. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

456 Political Sociology. (3) S: Cobas
Social factors associated with voting behavior; the nature and structure of the electorate and political parties, and the nature of national and international power structure.

457 Medical Sociology. (3) F: Weitz
Social aspects of physical and mental illness, and sociological analysis of the health care system and its practitioners. Prerequisite: SOC 101 or 301, or approval of instructor.

462 Social Control. (3) F: Staff
Significance of social control in society, and the various methods used by individuals and groups to control others. Prerequisite: SOC 360† or approval of instructor.

464 Sociology of Sex Roles. (3) S: Weitz
Sociological analysis of the development, nature, and consequences of traditional and alternative sex roles in contemporary society. Prerequisite: SOC 101 or 301, or approval of instructor.

483 History of Social Thought. (3) S. SS: Owen
Social thought in human culture. Background of modern sociology. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

485 Sociology of Knowledge. (3) F: Snow
Relationship between social conditions and the development of knowledge in modern society. Prerequisite: SOC 101 or 301, or approval of instructor.

486 Contemporary Theory. (3) S: Johnson
Contemporary issues and crises in social theory with major focus on particular theorists. Ideological factors in theory, philosophical issues, the nature of theory and its relationship with methodology. Prerequisite: SOC 101 or 301, or approval of instructor.

498 Pro-Seminar. (3) F. S: Staff
Topics to be selected.

501, 502 Practicum in Survey Research. (3, 3) F. S: Axelrod
A one-year research practicum in survey field work, analysis, and reporting in the Phoenix Area Study. Prerequisite: SOC 391†.

505 Social Statistics II-Multivariate Analysis. (3) F. SS: Cobas, McPherson
Analysis of variance, multiple regression, dummy variable regression, path analysis and related topics. Computer application to problem solving. Prerequisite SOC 390† or equivalent, and a proficiency examination. Enrollment in MAT 530 is encouraged

507 Social Statistics III: Advanced Multivariate Analysis (3) S. Cobas, McPherson
Computer application in sociology. Topics such as discriminant function analysis, factor analysis, canonical correlation, advanced multiple regression, and structural equation models are studied through the application of computers. Prerequisite: SOC 505 or approval of the instructor. Enrollment in MAT 533 is encouraged

515 Studies of the Family. (3) S: Farber
Current developments in the study of marriage and the family. Prerequisite: approval of instructor

585 Development of Sociology. (3) F: Hardert, Farber
Major sociological theorists, including Durkheim, Weber, Marx, Parsons, Merton, Dahrendorf, Homas, Mead. Prerequisite: approval of instructor.

586 Contemporary Sociological Theory. (3) S; Farber, Nagasawa
Analysis of major theories, including structural-functional conflict, social exchange, symbolic interaction, role theory. Prerequisite: approval of instructor.

587 Metasociology. (3) S; Staff
Nature of sociological assumptions. Nature and form of sociological theories. Context of discovery-grounded theory. Context of justification. Prerequisite: approval of instructor.

591 Seminar. (1-3) F, S; Staff

595 Methodological Issues in Sociology. (3) S; Farber, Nagasawa
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: SOC 391† or approval of instructor.

Special Courses. SOC 298, 484, 492, 493, 494, 497, 499, 500, 590, 592, 599, 700, 780, 791, 799. (See pages 32-33.)

Speech and Hearing Science

PROFESSORS:
CLUFF, MOWRER

ASSOCIATE PROFESSORS:
DORMAN (LL A-129A), CASE, CHUBRICH,
PRATHER

ASSISTANT PROFESSOR:
HANNLEY

DIRECTOR:
SPEECH AND HEARING CLINIC, WHALEY

Departmental Major Requirements Bachelor of Science Degree Curriculum Speech and Hearing Science.—The Bachelor of Science degree consists of a minimum of 45 semester hours of credit emphasizing the developmental and scientific aspects of language, speech and hearing. Freshmen may be admitted to the major if they are in the upper third of their high school graduating class. Other students, with at least one semester of college credit, may be admitted to the major if their cumulative GPA is at least 2.50. The following courses, or their approved equivalent, are required: SHS 105 or 305, 310, 311, 316, 320, 350, 367, 375, 390, 395, 400, 450, 465, and 490. Remaining courses, to complete the 45-hour requirement, may be selected from a list of approved electives available through the department.

Departmental Graduate Program

The Department of Speech and Hearing Science offers a program leading to the degree of Master of Science. Consult the *Graduate Catalog* for requirements.

SPEECH AND HEARING SCIENCE

SHS 105 Introduction to Speech and Hearing Science. (3) S

The normative and disordered processes of human communication.

217 Introduction to Manual Communication. F, S
American Sign Language (ASL): linguistic principles, expressive/receptive skills; terminology, cultural aspects, socio-educational trends, and sign systems.

305 Survey of Communication Disorders. (3) F, S
Role of the parent, teacher and others in support of evaluation and treatment of communication disorders.

306 Fundamentals of Communication Science. (3) F, S
Perception and memory processes in speech and language.

310 Anatomy and Physiology of Speech. (3) F, S
The neural, muscular and skeletal systems which subserve human speech behavior.

311 Anatomy and Physiology of Hearing. (3) F
The peripheral and central systems which subserve hearing.

316 Introduction to Hearing Impairment. (3) S
The interaction of environmental factors with hearing impairment. Prerequisite: SHS 311.

317 Intermediate Manual Communication. (3) F, S
Emphasis on increasing vocabulary and speed; development of greater fluency in ASL, including finger-spelling and non-verbal communication. Survey of deafness. Prerequisite: SHS 217.

320 Hearing Science. (3) S
Neurophysiological and psychoacoustic behavior of the auditory system. Prerequisite: SHS 311.

350 Phonetics. (3) S
Phonological theory and transcription of speech sounds using the international phonetic alphabet.

367 Language Acquisition in Early Childhood. (3) F, S
Process of language development in the normal child from birth through preschool.

375 Speech Science. (3) F
Normative aspects of speech, hearing, and language. Prerequisite: SHS 310, 311.

380 Introduction to Communication Disorders. (3) F
Comparison of normal with disordered communicative processes. Prerequisite: SHS 375.

395 Modifying Communicative Behavior. (3) F
Principles and techniques of modifying speech and language behavior. Prerequisites: PSY 212; SHS 105 or 305.

396 Disorders of Phonology. (3) S
Detailed analysis of disorders of articulation. Prerequisites: SHS 105 or 305, 310 and 395.

400 Methods of Audiometry. (4) F
Techniques and instrumentation used in measuring auditory threshold and audiogram interpretation. Three lectures, 3 hours laboratory. Prerequisites: SHS 316, 320.

417 Advanced Manual Communication. (3) F, S
ASL and English concepts and idiomatic expressions;

emphasis on ASL principles. Practice in building fluency in American; preparation for interpreting. Prerequisite: SHS 317.

425 Acoustic Phonetics. (3) F

Memory and perception of speech and language. Extensive description of the acoustic cues for speech. Prerequisites: SHS 310, 311, and 320.

430 Psychology of Hearing-Handicapped Children. (3) F

Effects of hearing impairment on child language acquisition, intellectual development, personality development and educational placement.

432 Aural Rehabilitation—Children. (3) S

Theories and practices in the rehabilitation of hearing-handicapped children.

435 Noise and Society. (3) S

Effects of noise on individuals and communities and practical solutions to noise problems. Prerequisite: SHS 320.

445 Perception and Production of Speech. (3) S

Recent advances in speech perception and production relevant to communication disorders. May be taken concurrently with SHS 425. Prerequisite: SHS 375 or approval of instructor.

450 Observation. (1) F, S

Supervised observation of evaluation and therapy representing the areas of language, speech, and hearing for a minimum of 25 clock hours. Prerequisite: approval of instructor.

465 Child Language Acquisition. (3) F

Consideration of the most recent developments in the study of child language acquisition.

490 Child Language Disorders (3) F

Introduction to the nature and treatment of language disorders in children. Prerequisites: SHS 310, 311, 367 or 465; 390 and 395.

502 Advanced Audiology. (3) S

Procedures in differential diagnosis of auditory pathologies. Prerequisite: SHS 400

504 Aural Rehabilitation: Hearing Aids. (3) F

Operation and application of amplifying devices relative to the aurally handicapped. Prerequisite: SHS 400.

505 Acoustics in Audiology. (3) S

Noncalculus introduction to acoustics, emphasizing the measurement of human communication processes. Prerequisites: algebra, trigonometry.

506 Physiological Measurements (3) F

Theory and application of physiological techniques for assessing the auditory system; evoked potentials, impedance testing, electronystagmography for differential diagnosis. Three hours lecture, one hour laboratory. Prerequisites: SHS 502 or 510.

508 Pediatric Audiology. (3) F

Auditory capability, audiologic testing, and management of young children and infants. Corequisite: SHS 527. Prerequisite: SHS 400.

510 Advanced Hearing Science. (3) F

Psychoacoustic and psychophysiological correlates of audition. Prerequisites: SHS 311, 320.

519 Research Procedures in Communication Disorders. (3) F

Research philosophy and models as applied to data collection, evaluation, and reporting in the field of communication disorders.

520 Disorders of Fluency. (3) F

Trends in understanding and working with persons who stutter.

521 Treatment of Disorders of Fluency. (2) S

Discussion of procedures currently used to improve speech fluency. Prerequisites: SHS 520 and approval of instructor. corequisite: SHS 551.

527 Evaluation: Audiometric Measurement. (1-6) F, S

One staffing and two hours client contact per week per hour of credit. May be repeated for credit. Prerequisite: approval of instructor.

528 Adult Aural Rehabilitation. (3) F

General principles of rehabilitation of the aurally handicapped adult, including educational and prosthetic approaches. Prerequisite: SHS 504 or approval of instructor

531 Neurophysiology of Hearing. (3) S

The neurophysiological processes subserving hearing. Prerequisites: SHS 311, 320.

540 Differential Diagnosis. (3) F

Procedures for assessing speech/language disorders in children and adults. Three hours lecture, 1 hour laboratory. Prerequisite: approval of the instructor.

541 Evaluation: Differential Diagnosis. (1-3) F, S

Two hours supervised client contact per week per hour of credit. May be repeated for credit. Prerequisite: approval of instructor.

545 Speech Perception and Production. (3) S

Current progress in production and perception of speech. May be taken concurrently with SHS 525. Prerequisite: SHS 375 or approval of instructor.

551 Therapy: Practicum. (1-6) F, S, SS

Supervised practicum in communication disorders: aural rehabilitation, articulation, aphasia, cerebral palsy, cleft palate, language, stuttering, and voice. One hour staffing. A minimum of two hours client contact per week, per hour of credit. May be repeated for credit. Prerequisite: approval of instructor.

565 Child Language Development. (3) S

Recent advances in the study of child language development. Not open to students with credit in SHS 465.

566 Psychology of Language. (3) S

Language and thought in interaction.

570 Professional Issues in Communication Disorders. (3) S

Professional issues facing graduating students in communication disorders as they relate to individual class members and their involvement in the profession.

575 Neurological Disorders of Speech—Aphasia. (3) F

Communication disorders related to the language sections of the central nervous system, assessment and treatment of persons manifesting such damage.

576 Neurological Disorders of Speech—Cerebral Palsy. (3) S

Communication disorders related to cerebral palsy; assessment and treatment.

577 Orofacial Disorders of Communication—Cleft Palate. (3) S

Communication disorders related to anomalies of the orofacial structures, including cleft lip with or without cleft palate, and dental malocclusion. Prerequisite: SHS 310 or approval of instructor.

578 Disorders of Voice. (3) F

Communication disorders related to dysfunction of the

phonatory and resonance systems of voice production, assessment and treatment. Prerequisite: SHS 310 or approval of instructor.

584 Internship in Communication Disorders. (1-6) F, S, SS

Off-campus directed experiences in speech pathology, language disorders, or hearing disorders. May be repeated for credit. Prerequisite: permission of department; student must reserve enrollment by early registration.

590 Reading and Conference. (3) F, S

591 Seminar. (3) F, S

592 Research. (3) F, S

Special Courses: SHS 294, 484, 494, 498, 499, 500, 580, 584, 593, 598, 599.

Zoology

PROFESSORS:

ALVARADO (LS C-226), ALCOCK, BERTKE, CHURCH, DOANE, GERKING, HADLEY, LANDERS, McGAUGHEY, MINCKLEY, PATTERSON, RASMUSSEN, WOOLF

ASSOCIATE PROFESSORS:

COLLINS, FISHER, FOUQUETTE, GOLDSTEIN, HASBROUCK, HAZEL, JUSTUS, OHMART, RUTOWSKI

ASSISTANT PROFESSORS:

CHANDLER, FAETH, SATTERLIE, SMITH, WALSBERG

LECTURER:

MILSTEIN

Departmental Major Requirements Bachelor of Science Degree Curriculum

Biological Sciences. See page 64.

Zoology—Consists of a minimum of 67 hours, of which 34 must be in the major. Required major courses are: BIO 101, 102†, 320†, 340†, 445†; ZOL 280†, 360†; BIO 430† or ZOL 330†; ZOL 270† or ZOL 350† or ENT 300†. Required supplementary courses are CHM 113, 115† and either of the following chemistry sequences: CHM 331†, 332†, 335†, 336†; or 231†, 261†; MAT 115† and/or 210†, MAT 270†, 271†, 272† or MAT 290†, 291†; CSC 182†; PHY 111†, 112†, 113†, 114†. One year of a foreign language or equivalent competence.

Wildlife Biology—Two options are available:

The *Wildlife Management Option* consists of a minimum of 89 hours, of which 65 must be in the major. Required *major courses* are: BIO 101, 102†, 217†, 320†, 340†, 415†; ZOL 270†, 360†, 411†, 412†; ENT 300†; BOT

370†, 420†; ERA 360† or 370†; plus a minimum of four courses from the following: ZOL 413†, 414†, 420†, 424†, 471†, 472†, 474†; GLG 101†; ERA 325†, 326†. Required *supplemental courses* are: CHM 113; CHM 115† or 116†; CHM 231†; MAT 115†, 210†; COM 300† or 311†; CSC 182†. Students planning to enter graduate school should substitute CHM 331†, 332†, 335†, 336† for CHM 231 and should take PHY 111†, 112†, 113†, 114†.

The *Fisheries Management Option* consists of a minimum of 72 hours, of which 45 must be in the major. Required major courses are: BIO 101, 102†, 217†, 320†, 340†, 415†, 426†, 427†; ZOL 270†, 350†, 360†, 413†, 473†. Required *supplemental courses* are: CHM 113; CHM 115† or 116†; CHM 231†; MAT 115†, 210†; PHY 111†, 112†, 113†, 114†. Students planning to enter graduate school should substitute CHM 331†, 332†, 335†, 336† for CHM 231.

Entomology—Consists of a minimum of 37 hours in the major. Required courses are: BIO 101, 102†, 320†, 340†, 445†; ZOL 280†, 360†; ENT 300†, 420†, 430†, 551†. Required supplementary courses are: CHM 113, 115†, and either of the following chemistry sequences, CHM 331†, 332†, 335† and 336† or CHM 231† and 261†; CSC 182†; MAT 115; 210† or MAT 270†, 271†, 272† or 290†, 291†; PHY 111†, 112†, 113†, 114†; one year of a foreign language. (See Graduation Requirements, page 39.)

Departmental Graduate Program

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

BIOLOGY

BIO 100 The Living World. (4) F, S, SS

Principles of biology. Cannot be used for major credit in the biological sciences. Three hours lecture, 3 hours laboratory.

101, 102 Biological Principles and Processes. (4, 4) F, S
Biological concepts emphasizing fundamental principles and the interplay of structure and function at the molecular, cellular, organismal, and population levels of organization. For majors in biological sciences and preprofessional students in health related sciences. Secondary school chemistry strongly recommended (BIO 101 is a prerequisite for BIO 102). Three hours lecture, 3 hours laboratory.

217 Introduction to Fisheries and Wildlife Management. (3) F

Management of fisheries and terrestrial wildlife, emphasizing management of ecosystems. Designed for prospective Wildlife biologists. Prerequisites: 8 hours of biology.

218 History of Medicine. (1) F

Development of medical concepts.

300 Natural History of Arizona. (3) F

Plant and animal communities of Arizona. Cannot be used for major credit in the biological sciences. Prerequisite: junior standing.

301 Field Natural History. (1) F, S

Organisms and their natural environment. Two weekend field trips and a field project. Prerequisite: BIO 300 or concurrent enrollment. Cannot be used for major credit in the biological sciences.

310 Special Problems and Techniques. (1-3) F, S

Qualified undergraduates may investigate a specific biological problem under the direction of a faculty member. Prerequisites: approval of the problem by the faculty member and departmental chair. May be repeated for a total of 6 credits.

320 Fundamentals of Ecology. (3) F, S

Organization, functioning and development of ecological systems, energy flow, biogeochemical cycling, environmental relations, population dynamics. Prerequisites: BIO 102† or approval of instructor.

330 Ecology and Conservation. (3) F

Ecological and biological concepts of conservation used to understand man-made ecological problems. Cannot be used for major credit in the biological sciences.

340 General Genetics. (4) F, S, SS

Science of heredity and variation. Prerequisite: BIO 102†. Three hours lecture, 1 hour recitation.

415 Biometry. (4) F

Statistical methods applied to biological problems, design of experiments, estimation, significance, analysis of variance, regression, correlation, chi square and bioassay, the use of computers. Does not satisfy laboratory requirements for the Liberal Arts General Studies program. Prerequisites: MAT 210† or equivalent. Three hours lecture, 3 hours laboratory.

424 Analysis of Ecosystems. (3) S

Ecosystems emphasizing production, respiration, and decomposition. Prerequisites: senior or graduate standing, BOT 420† and ZOL 425† or equivalents.

425 Laboratory Ecosystem Analysis. (1) S

Methods of analyzing energy flow and nutrient cycling. Prerequisites: BOT 424† and ZOL 425† or equivalents. Three hours laboratory.

426 Limnology. (3) F

Dynamics of inland waters, stressing the interrelations of climatic, geological, topographical, physical and chemical factors with special reference to aquatic life. Prerequisites: CHM 113; ZOL 350†.

427 Limnology Laboratory. (1) F

Three hours laboratory. Prerequisites: BIO 426† or approval of instructor.

428 Biogeography. (3) F

Environmental and historical processes determining distributional patterns of animals and plants, emphasizing terrestrial life. Prerequisites: BIO 102† or equivalent; junior standing.

429 Advanced Limnology. (3) S

Recent literature, developments, methods and limnological theory; field and laboratory application to some particular topic in limnology. Prerequisite: BIO 426†.

430 Concepts in Developmental Biology. (3) S

Current concepts and experimental methods involving differentiation and biosynthetic activities of cells and organisms with examples from micro organisms, plants and animals. Prerequisite: BIO 102† or equivalent.

432 Biochemical Cytology. (3) S

Cellular functions and chemistry based on the macromolecular organization of cellular components, emphasizing the use of analytical procedures such as cell fractionation, ultrastructural radioautography, and cytochemistry. Prerequisites: BOT 360† or ZOL 360† or equivalent; CHM 231† or 331† or equivalent.

441 Cytogenetics. (3) F

Chromosomal basis of inheritance. Prerequisite: BIO 340†.

442 Cytogenetics Laboratory. (2) F

Microscopic analysis of meiosis, mitosis and aberrant cell division. Prerequisites or concurrently: BIO 441† and graduate status. Six hours laboratory.

443 Molecular Genetics. (3) F, SS

Nature and function of the gene. Prerequisites: BIO 340† and a course in organic chemistry.

445 Organic Evolution. (3) F

Processes of adaptive change and speciation in populations. Prerequisite: BIO 340† or ZOL 241.

464 Photobiology. (3) S

Principles underlying the effects of light on growth, development, and behavior of plants, animals, and microorganisms. Prerequisites: 12 hours of courses in life sciences, CHM 231† or 331†.

480 Methods of Teaching Biology. (3) S

Methods of instruction, experimentation, organization and presentation of appropriate content in biology. Prerequisites: either SED 311† or concurrent enrollment in SED 311† and 20 hours in the biological sciences. Two hours lecture, 3 hours laboratory.

512 Transmission Electron Microscopy. (4) F, S

Theory, use, and methods of preparing biological materials for transmission electron microscopy. Prerequisite: approval of instructor. Material fee. Two lectures, 6 hours laboratory.

515 Scanning Electron Microscopy. (2) N, SS

Theory and use of scanning electron microscope for biological materials. Intensive five-week mini course. Prerequisite: approval of instructor. Materials fee. Three hours lecture, 6 hours laboratory.

520 Biology of the Desert. (2) S

Factors affecting plant and animal life in the desert regions and adaptations of the organisms to these factors. Prerequisite: 10 hours of biological sciences or approval of instructor.

526 Quantitative Ecology. (3) N

Sampling strategies, spatial pattern analysis, species diversity, classification and applications of multivariate techniques to ecology. Prerequisites: one course in ecology; BIO 415† or equivalent. Two hours lecture, 3 hours laboratory.

Special Courses: BIO 492, 493, 494, 497, 498, 499, 500, 590, 591, 592, 598, 599. (See pages 32-33.)

ENTOMOLOGY

ENT 300 General Entomology. (4) F, S
Form, activities and classification of insects. Prerequisites: BIO 102†. Three hours lecture, 3 hours laboratory.

400 Aquatic Insects. (3) S '83
Systematics and ecology of aquatic insects. Prerequisite: ENT 300†.

420 Insect Ecology. (3) F
Interrelations of insects and their environments. Prerequisites: BIO 320†.

430 Insect Morphology. (4) F '82
Morphology of typical insects including both external and internal structure. Prerequisite: ENT 300†. Two hours lecture, 6 hours laboratory.

551 Systematic Entomology. (4) S
Classification of insects; taxonomic categories and procedures; bibliographical methods; nomenclature, museum practices. Prerequisite: ENT 300†. Two hours lecture, 6 hours laboratory.

Special Courses: ENT 590, 592, 599. (See pages 32-33.)

ZOOLOGY

ZOL 110 Contemporary Zoology. (4) F, S
Topics emphasizing socially relevant problems. Cannot be used for major credit in the biological sciences. Three hours lecture, 3 hours laboratory.

201 Human Anatomy-Physiology. (4) F, S, SS
Structure and dynamics of the human mechanism. Cannot be used for major credit in the Department of Zoology. Three hours lecture, 3 hours laboratory.

202 Human Anatomy-Physiology. (4) F, S, SS
Continuation of ZOL 201. Cannot be used for major credit in the Department of Zoology. Prerequisite: ZOL 201 or approval of instructor. Three hours lecture, 3 hours laboratory.

241 Human Genetics. (3) F, S, SS
Human heredity and variation, emphasizing medical and population genetics.

270 Vertebrate Zoology. (4) F, S
Characteristics, classification, evolution and natural history of the major groups of vertebrate animals. Prerequisite: BIO 102†. Three hours lecture, 3 hours laboratory.

280 Introductory Animal Behavior. (3) F
Evolutionary, genetic, physiological and ecological bases of animal behavior. Prerequisite: Four hours of BIO, or ZOL, or approval of instructor.

300 Bioconcepts. (2-3) F, S, SS
Contemporary topics as related to human affairs. Cannot be used for major credit in the biological sciences. May be repeated for credit by using different sections.

- (a) Genes and Evolution (3).
- (b) Sociobiology (3).
- (c) The Ecocrisis (3).
- (d) Parasites (3).
- (e) Blood (2) F. One lecture, 3 hours laboratory.
- (f) Guts (2) S. One lecture, 3 hours laboratory.
- (g) Historical Perspectives (3).

311 Animal Microtechnique. (2) N
Zoological microtechnique, including the preparation for microscopic examination of animal structures, tissues, cells and whole mounts. Prerequisite: BIO 102†. Six hours laboratory.

330 Vertebrate Developmental Anatomy. (5) F
Ontogenetic sequence of morphology, comparative anat-

omy and evolutionary trends of organ systems of vertebrates. Prerequisites: BIO 102† or equivalent. Three hours lecture, two 3-hour laboratories.

350 Comparative Invertebrate Zoology. (4) F
Characteristics, life cycles, adaptational biology, and evolution of invertebrate animals. Prerequisites: BIO 102† or approval of instructor. Three hours lecture, 3 hours laboratory.

360 Basic Physiology. (4) F, S
Physiological mechanisms of the higher vertebrates. Prerequisites: BIO 102†, CHM 115†, MAT 115. Three hours lecture, 3 hours laboratory.

411, 412 Wildlife Management I, II. (4, 4) F, S
Principles, practices and techniques of wildlife management. Prerequisites for ZOL 411: BIO 217†, 320†, ZOL 471†, 472†; or approval of instructor. Prerequisite for ZOL 412: ZOL 411†. Three hours lecture, 3 hours laboratory or field trips, weekend field trips.

413 Fisheries Management I. (4) F
Principles and theory of fisheries management. Prerequisite: 10 hours of biology. Three hours lecture, 3 hours laboratory or field trips, weekend field trips.

414 Fisheries Management II. (4) S
Practices and techniques of fisheries management. Prerequisite: ZOL 413†. Two hours lecture, 6 hours laboratory or field trips, weekend field trips.

420 Field Zoology. (3) F, SS
Field techniques and experience in collection and preparation of zoological specimens and data. F: One hour lecture, about 6 weekend field trips. SS: One week preparation, then at least 14 days of next 4 weeks in the field. Prerequisites: 20 hours in biological sciences and approval of instructor.

424 Parasitology. (4) F
Morphology, physiology and life histories of animal parasites, therapeutics, control and host-parasite relationships. Prerequisite: BIO 102†. Three hours lecture, 3 hours laboratory.

425 Animal Ecology. (3) F
Interrelations of animals and their environments. Prerequisite: BIO 320†.

427 Laboratory in Animal Ecology. (3) F
Laboratory and field studies; quantification and analysis of ecological relations. Prerequisite: BIO 320† or approval of instructor. Nine hours laboratory or field. Weekend field trips.

432 Animal Cytology. (3) F
Structure and function of the cell, based upon ultrastructural organization. Prerequisite: BIO 102†.

433 Animal Histology. (4) S
Microscopic studies of animal tissues. Prerequisites: BIO 102† or approval of instructor. Two hours lecture, 4 hours laboratory.

440 The Nucleus. (3) S
Experimental studies in chromatin and chromosome structure. Molecular mechanisms of chromosome movement and mechanics, cell population kinetics, the nucleolus and the nuclear envelope. Prerequisites: CHM 261† or 335†, and BIO 340†.

453 Protozoology. (3) N
Systematics and biology of protozoa. Prerequisite: BIO 102†. Two hours lecture, 3 hours laboratory.

460 Comparative Physiology. (4) F '81

The analysis of function in invertebrates and vertebrates, emphasizing evolutionary trends in physiological systems. Prerequisite: ZOL 360† or equivalent. Three hours lecture, 3 hours laboratory.

468 Mammalian Physiology. (4) S '83

Detailed treatment of mammalian organ system functions emphasizing integrative mechanisms. Prerequisite: ZOL 360† or equivalent. Three hours lecture, 3 hours laboratory.

469 Cellular Physiology. (4) F '82

Emphasizing the molecular basis for cell structure and function. Prerequisites: ZOL 360†, organic chemistry. Three hours lecture, 3 hours laboratory.

471 Ornithology. (3) S

Natural history and field study of birds, emphasizing Arizona species. Prerequisite: ZOL 270† or approval of instructor. Two hours lecture, 3 hours laboratory. Weekend field trips.

472 Mammalogy. (4) F

Classification, structure, habits, ecology and distribution of mammals, emphasizing North American forms. Prerequisite: ZOL 270† or approval of instructor. Three hours lecture, 3 hours laboratory or field trip. Weekend field trips.

473 Ichthyology. (3) S '83

Systematics and biology of recent and extinct fishes. Prerequisites: ZOL 270†, 425† or approval of instructor. Two hours lecture, 3 hours laboratory or field trip. Weekend field trips required.

474 Herpetology. (3) S '82

Systematics and biology of recent and extinct reptiles and amphibians. Prerequisite: ZOL 270†. Two hours lecture, 3 hours laboratory or field trip.

481 Laboratory in Animal Behavior. (3) S

Experimental and field studies of animal behavior; description and quantification of animal behavior, interpretation of behavior within an evolutionary framework. Prerequisite: ZOL 280. One hour lecture, 6 hours laboratory.

515 Populations: Evolutionary Genetics. (3) F

Mathematical models in the description and analysis of the genetics of populations. Prerequisites: BIO 320†, 415†, and 445†, or approval of instructor.

516 Populations: Evolutionary Ecology. (3) S

Principles of population biology and community ecology within an evolutionary framework. Prerequisites: MAT 210† or BIO 415†, 320†, ZOL 515†. Two hours lecture, 2 hours recitation.

532 Developmental Genetics. (3) S '82

Genetic approaches to the analysis of development during the life cycle of eukaryotic organisms, role of genes in the unfolding of the differentiated phenotype. Prerequisite: BIO 443†.

540 Chromosome Techniques. (2) N

Prerequisite: approval of instructor. Six hours laboratory.

565 Advanced Parasitology. (3) N

Historical and analytical approach to the treatment of selected areas in the body of knowledge relating to parasites and parasitism. Prerequisite: ZOL 424†.

566 Environmental Physiology. (3) S '82

Physiological responses and adaptations of animals to various aspects of the physical environment. Prerequisites: ZOL 360†; BIO 320†.

Special Courses: ZOL 294, 484, 492, 493, 494, 497, 498, 499, 590, 591, 592, 594, 598, 599, 790, 791, 792, 799. (See pages 32-33.)



College of Architecture

Hugh Burgess, D. Arch., A.I.A.

Dean

Purpose

The central function of the College of Architecture is to educate students at the pre-professional, professional and graduate levels for architecture, planning and design science careers, and to provide leadership to these professions through the development and dissemination of new knowledge resulting from both faculty and graduate research studies. The College also contributes to community efforts to conserve and improve the quality of our natural and built environments through the Research and Service Foundation Office.

Organization

The College is composed of three academic units: the Department of Architecture, the Department of Design Sciences and the Department of Planning, each administered by a chair. The general administration of the College and the Research and Service Foundation Office is the responsibility of the Dean, who in turn is responsible to the President through the Provost.

Affiliations

The College of Architecture maintains active affiliations with the Arizona Society of Architects; the Central Arizona and the Rio Salado Chapters of the American Institute of Architects; the Associated Student Chapters of the American Institute of Architects; the Association of Collegiate Schools of Architecture; the American Planning Association; the Association of Collegiate Schools of Planning; the American Society of Landscape Architects; the Council of Educators in Landscape Architecture; the Society of Automotive Engineers; the American Society of Interior Designers; the Industrial Designers Society of America;

the Interior Design Educators Council; and the National Student Council of the American Society of Interior Designers; and the Society of Automotive Engineers.

Accreditation

The professional program in architecture is accredited by the National Architectural Accrediting Board and recognized by the Arizona State Board of Technical Registration and the National Council of Architectural Registration Boards. The degree in industrial design is approved by the Industrial Designers Society of America. Approval or accreditation of programs in interior architecture, landscape architecture, and urban and regional planning is pending.

Facilities

The College of Architecture provides lecture and seminar rooms, design and technology laboratories, an activity center, and student, faculty and administrative offices. The College contains photographic, environmental, structural, and computer laboratories, a media center with an extensive audiovisual collection, materials exhibition spaces, and the Gallery of Design.

The Howe Library, a branch library for architecture, planning, and design sciences, serves the academic needs within the College of Architecture as a regional resource library for the general University community and for practicing professionals.

The computer-aided design lab is also the Computer Graphics Lab for the University. The lab provides data processing services to architects, engineers, and planners, including

energy modelling and analysis, comprehensive 3-D imaging (perspective, axonometric and isometric), space planning, and land-use analysis for urban and regional planning. In addition, the computer lab offers short courses and workshops in computer applications for both the academic and professional communities.

The Gallery of Design provides an exhibit area for works and projects related to architecture, design science, industrial design, interior architecture, landscape architecture, city planning, housing and urban development, urban and regional planning, visual communication, design history and theory, and energy technology.

The College of Architecture maintains an outdoor laboratory adjacent to the College for solar, structural and materials testing and an additional 1,500 square feet of rooftop testing laboratory for solar research.

The College of Architecture Research and Service Foundation Office is a non-profit organization which receives and administers tax deductible contributions and contracts from private or public sources, as approved by Arizona State University, to provide for the enrichment of the programs and services it administers. These are community service projects, environmental research, continuing education, and publication of research-related books, pamphlets and documents. An energy efficient house/lab demonstration unit, designed by this office, is available for experimentation and research related to energy technology, and is programmed for future conversion to house the offices and lab spaces of the foundation.

Information

Further information concerning the various courses of study, advice on pre-professional, professional level and graduate studies, admission procedures, and expenses and financial assistance are in the publications of the College. Requests for these publications and professional level program application forms should be addressed to the Academic Advisor, College of Architecture, Arizona State University, Tempe, Arizona 85287.

Students seeking admission to a College of Architecture professional level program are advised to complete the two-year minimum course of study entitled "Pre-Professional Studies." (Students seeking admission to the

College for graduate work should review the appropriate graduate studies information in each department's program descriptions.

General Studies Courses

These courses are open to any student of the University meeting the stated pre/corequisites and are recognized in other colleges' programs of General Studies.

(Graduate students or professional-level students enrolled in colleges other than Architecture may be permitted to enroll in certain courses with the approval of the dean, the department chair and the instructor. Design and technology laboratories are open only to students enrolled in the appropriate College of Architecture professional level program.)

The General Studies courses are identified under each department or program.

Grading. Students enrolled in General Studies or pre-professional courses will be graded according to the University grading system. Students in professional level programs will be graded on a numerical scale which will be converted to a letter grade for purposes of reporting to the University. The College does not give "Pass-Fail" grades in either professional level or General Studies courses.

Degrees

Bachelor of Science in Design. A two-year program of studies at the advanced undergraduate level leading to the degree Bachelor of Science in Design, and entry into the related design professions. Majors under this degree are in design sciences, housing and urban development, industrial design, interior architecture, and urban planning. Areas of concentration within this degree are design sciences, city planning, and landscape architecture. See Pre-Professional Studies, page 149, and the Departments of Architecture, Design Sciences and Planning, Professional level programs, pages 152, 157, 163.

Bachelor of Architecture Degree. At present, the College of Architecture offers a three-year professional program of study at the advanced level leading to the first professional degree, Bachelor of Architecture. Under current consideration is a new four-year program of studies administered by the Department of Architecture leading to the first professional degree, Master of Architecture. For specific information, scheduling and initiation dates, contact the Department of Architecture for the separate *College of Ar-*



chitecture Bulletin. As the transfer from the Bachelor of Architecture degree to the Master of Architecture degree is completed and full accreditation for the Master of Architecture degree is established, the Bachelor of Architecture degree will be phased out. See Pre-Professional Studies, page 149 and Department of Architecture Professional Level Programs, page 152.

Joint Degree: B. Arch./M.S. (Civil Engineering). A program of studies is offered jointly by the College of Architecture and the College of Engineering and Applied Sciences, leading to the professional degrees, Bachelor of Architecture and the Master of Science with a major in Civil Engineering. The two-year course of pre-professional studies may be completed in the Department of Civil Engineering, College of Engineering and Applied Sciences (or at another comparable institution). Qualified students may then be admitted to the College of Architecture for a three-year course of professional level studies to qualify for the degree Bachelor of Architecture. Following that, the students will complete the one-year program to qualify for the Master of Science degree. Upon initiation of the proposed M.Arch. degree, students seeking this course of study would be eligible for both an M.Arch. and an M.S. degree with a major in Civil Engineering. For further information contact the Department of Architecture for the separate *College of Architecture Bulletin*.

Master of Environmental Planning. A graduate program offered by the faculty in the Department of Planning leads to the degree Master of Environmental Planning with a major in Environmental Planning. See Department of Planning, Graduate Program, page 167.

Admission

Students are admitted to the Pre-Professional Studies, options A or B, of the College of Architecture upon approval of admission to Arizona State University. A separate admission procedure is required for entry to all professional level and graduate programs sponsored by the departments of Architecture, Design Science, and Planning. Students are admitted to the professional level program in classes starting each Fall Semester only.

Transfer Students. It is the policy of the College of Architecture to accept, on a space available basis, transfers from the professional

programs of other accredited institutions. A student who has completed the first or second year of a professional program with a substantially better than average grade point at an accredited institution may be permitted to transfer into the ASU College of Architecture with advanced standing. A transfer applicant is considered, however, only to the extent that vacancies exist in the relevant professional level. All conditions for transfer shall be set forth by the respective department at the time of admittance. The amount of credit to be allowed for previous pre-professional or professional level work shall also be set forth at the time of admittance. At a state institution, residency may be a factor for admission.

No transfer credit is granted for courses with less than "C" grades. The College reserves the right to deny or reduce credit for particular courses. Grades received in another professional level program are not counted in determining a student's cumulative grade-point average in the College of Architecture professional level program.

Graduate Program. For admission to the graduate level programs in the College of Architecture, see requirements and procedures under the respective departments and the *Graduate Catalog*. The general requirements are:

1. Completion of all admission requirements and procedures set forth by the Graduate College and additional requirements of the respective department.
2. Completion of baccalaureate degree and acceptance by the Admissions Committee.
3. Submission and approval of a proposed course of study in a specialization offered by the respective department.

General Information

Special Honors at Graduation. At the time of graduation, students with academic distinction in the professional level programs of the College may be awarded by the University the respective designation *cum laude*, *magna cum laude*, or *summa cum laude*. Recipients of these awards are selected by the respective department on the basis of graded performance in all college and professional level courses for the length of the particular program.

Special college recognition is also awarded to those students selected by the respective

department on the basis of graded performance in required professional level courses only in their particular program.

Employment. It is difficult for professional level students to carry part-time employment while in school. Acceptance of admission to undergraduate studies in the College carries a commitment on the part of the student to an eight-hour day in the College in order that the necessary time will be available for professional studies. However, if there is no other solution to the financial problem, then it is strongly recommended that employment not exceed 10 hours per week, and the department chair be informed.

Financial Aids. A wide variety of financial aids and loan programs are available to students with demonstrated need without regard to race, creed, color, national origin, or sex. For further details consult the University Financial Aids Office.

Advisement and Counseling. Student records are maintained by the academic advisor for pre-professional studies located in the Architecture Annex. Professional level and graduate student records are maintained by the respective department chair. Appointments may be made with the academic advisor or the respective department chair to discuss academic records, completion of requirements, certification for graduation, and evaluation of long-term goals. It is, however, the ultimate responsibility of each student to register for and to complete all academic requirements of pre-professional, professional and graduate level programs, and maintain the minimum scholastic standards set by the respective department and the College. Day-to-day career advisement and counseling is available on an unofficial basis from all faculty members; however, all official decisions regarding academic standards and requirements are the responsibility of respective director, department chair, or Dean of the College.

Resources

Research and Service Foundation Office. The Foundation was established in June, 1958 to provide for enrichment of the programs of the College of Architecture. It supports programs relating to environmental research, community service, publications and continuing education.

College of Architecture Alumni Association. This association was formed on September 4, 1974, with the recognition that

graduates can and should bring to the College a special contribution by acting as liaisons with the College, community, students, and the practicing profession.

Student Professional Associations. The purpose of the student associations is to assist students with the transition into professional life, and to acquaint them with the profession relating to their program of study.

Student Government Organization. The student body of the College of Architecture, in both pre-professional and professional level studies, maintains a student government organization for the purpose of providing student representation in development of various policies and programs within the College and in each department.

Retention Standards

General. To be eligible to continue in the undergraduate programs in the College of Architecture, a student must successfully complete each semester according to the standards established for each program. See Retention Standards-Professional Level Programs. The College of Architecture also requires students to meet all standards for retention of the Graduate College. (See page 370.)

Code of Professional Student Responsibility. The purpose of this code is to promulgate standards of conduct for students of the College of Architecture, and to establish procedures for dealing with violations. As environmental designers, all professional level students are expected to support and maintain the highest professional standards with regard to their individual conduct and their personal and common environments of the College of Architecture during their tenure at this institution. (Code adopted Fall, 1974.)

Undergraduate Professional Level Studies

General Information

The following information pertains to all undergraduate professional level programs of the College. Students not currently enrolled in Arizona State University who are interested in pursuing professional level studies in Architecture, Design Sciences, and Planning, and the separate professional level majors and areas of concentration offered within the College of Architecture, should contact the Director of Admissions, Arizona State University, Tempe, Arizona 85287. If qualified for University

admission, students may apply to the College of Architecture, requesting acceptance to one of its programs.

Students residing in states other than Arizona, or in foreign countries, are encouraged to consider completing the pre-professional requirements at their local institutions. Residency at Arizona State University for this preparatory course work does not alter the separate and selective admission requirements to undergraduate or graduate professional level studies in the College's programs, nor does attendance at ASU for pre-professional studies guarantee admittance to any of the undergraduate or graduate professional level programs of the College.

The undergraduate professional level programs in the College of Architecture are 1) a two-year course of study leading to the degree Bachelor of Science in Design, and 2) a three-year course of study leading to the degree Bachelor of Architecture. Upon initiation of the proposed M.Arch. degree, the three-year Bachelor of Architecture degree will be phased out and undergraduate students in the Architecture major will receive the two-year Bachelor of Science in Design degree. The majors and areas of concentration for these degrees are listed below with their respective departments:

Department of Architecture: B. Arch. (M. Arch. currently being proposed)
 Architecture (major)
 Architecture/Engineering (concentration)

Department of Design Sciences: B.S. Design
 Design Science (major)
 Industrial Design (major)
 Interior Architecture (major)

Department of Planning: B.S. Design
 Housing and Urban Development (major)
 Urban Planning (major)
 City Planning (concentration)
 Landscape Architecture (concentration)

Degree Requirements

To fulfill the requirements for these degrees a student must satisfy all of the following:

1. Admittance to the professional level program by the sponsoring department as a candidate for the degree and satisfaction of any conditions imposed at the time of admission to professional level studies or prior to graduation during the course of his/her study.

2. Satisfaction of full-time residency and attendance requirements for the specific College of Architecture program.
3. Successful completion of the minimum specified hours of academic professional level studies credit with a cumulative numerical average of 70 or better in the professional level courses only.
4. Completion of all College of Architecture required courses for the specific professional level program.
5. Maintenance of a personal code of conduct in keeping with the highest standards of a professional level student.

A student must be in residence and in full-time attendance for a minimum of four semesters or their equivalent to the specific program, with the exception of those students who transfer with advanced standing from another accredited professional level program. A semester in residence is earned when a student has been enrolled and maintains, without dropping course work, a minimum of 12 credit hours as specified by the respective program. A student admitted with advanced standing must complete the work of at least two semesters in the College of Architecture immediately preceding the granting of a degree.

Professional Level Programs

(For further information, see appropriate University and College Professional Level Programs literature.)

Admission Requirements and Procedures

The requirements and procedures for admission to the professional level programs of the College of Architecture are separate from and subsequent to the completion of Pre-professional Studies Options "A" or "B" as described in this *General Catalog*.

Application Procedures. Application to professional level programs within the College of Architecture is separate from, and in addition to, the required admission to Arizona State University. (Students not in attendance at ASU must contact the ASU Director of Admissions to obtain University application forms and procedures.) Students having completed all entrance requirements to the University by the application deadline herein, and those completing all pre-professional requirements by work in progress in the Spring Semester, who wish to apply must have *all* application documents accepted by the respec-

tive department office prior to the May 1 deadline for admission to the following fall term only (or the preceding Friday if May 1 falls on a Saturday or Sunday).

Entrance. The formal requirements for admission typically are:

1. Certificate of admission in good standing by application date—Arizona State University.
2. A cumulative grade index of 3.00 (B) or above for pre-professional required courses only, or their substitutes approved by the academic advisor, completed at all institutions attended.
3. Submission of ACT, SAT, or GRE test scores, whichever are applicable.
4. Completion of all specified pre-professional studies requirements at ASU or other institutions, including community colleges.
5. An average cumulative grade index of 3.00 (B) or above for pre-professional design and communications core courses, or their approved substitutes.
6. Evidence of developed skills in drawing and sketching, design graphics, two- and three-dimensional design, and other evidence of the applicant's creative and organizational endeavors as described by the required portfolio submittal with a minimum evaluation of 2.00 (C) by the respective departmental Admission Review Committee.
7. Good character evidenced by three supporting letters, attendance records, and other records from high school and previous college experience.
8. Formal selection of the candidate by the respective department.

In an unusual circumstance, when the admission standard deficiency is slight, written evidence of extenuating circumstances is convincing, and promise for success is evidenced, a student may be granted admission on a provisional basis.

The limited number of spaces available each year will be awarded to applicants evidencing the highest promise for professional success, including evidence of ability and prospect for significant public service. At a state institution, residency may be a factor for admission.

Final Admission and Notification

All application materials, including a copy of the University's certificate of admission, are to be included in the *portfolio* as described below, which is to be submitted and accepted by

the respective department no later than May 1, or on the prior Friday should May 1 fall on a Saturday or Sunday.

Final evaluations are made by the respective department and approved by the Dean upon receipt of transcripts showing the completion of all pre-professional requirements, which are to include Spring Semester grades if this course work is necessary to complete the pre-professional requirements. To ensure consideration, an applicant, *whether or not in attendance at ASU*, must have final transcripts submitted to the department *no later than June 15*. All applicants can expect to be informed by letter of final admission or non-admission on or about July 1. A signed receipt of admission conditions is required to be returned by the successful applicants prior to July 15 for final certification of admission and registration of classes.

Department Application

All of the following items are in addition to the documents submitted to the ASU Director of Admissions for University admission. All documents must be obtained by the applicant and submitted at one time, bound together in 8½"x11" Ful-Vu CB-10 portfolio or an equivalent size presentation binder with plastic sleeves. Items must appear in the following order:

- Page 1* - College of Architecture application form, for undergraduate professional level programs, completely filled out with page 1 visible. (These are available upon request from the College, departments or academic advisor.)
- Page 2* - Application form with page 2 visible.
- Page 3* - High school transcripts from all schools attended, including attendance and personal records.
- Page 4* - Certificates of ACT, SAT or GRE test scores, whichever are applicable.
- Page 5* - College transcripts from all schools attended, showing completion of pre-professional requirements. *Final transcripts including the Spring Semester must be submitted and accepted by June 15* for all applicants.
- Page 6* - Names and addresses of persons who are supplying letters of recommendation for their application. These letters of recommendation are to be sent directly to the respective department you are applying to

on forms supplied by the College, department or academic advisor. *Letters due in department office by June 1.*

Page 7 - Blank - for letters when received.

Page 8 - Copy of Arizona State University Certificate of Admission.

Pages following - Examples showing the level of development of the applicant's graphic skills and creative ability: a) four or five examples of sketches and drawings, b) four or five examples of two- or three-dimensional designs, c) two or three examples of basic graphic or drafting skills, and d) one or two examples of organizational or creative endeavors. These are minimum requirements.

Additional examples of self-directed skills and creative endeavors that the applicant believes may best represent his/her aptitude also may be included as desired. Original examples or slides *must not be submitted*. All examples shall be photographs or other reproduction graphic media of *original* work by the applicant.

Application documents remain the property of the department. However, graphic examples may be returned after final admission provided the applicant encloses a self-addressed, return mailer with sufficient prepaid postage or personally signs for return of the examples following the selection date. Examples not so returned will be discarded by the department after retention for one year after the submittal date. The College or the respective department assumes no liability for lost or damaged materials.

For further information on both pre-professional and professional level studies offered by the departments of the College of Architecture, contact: Academic Advisor, College of Architecture, Arizona State University, Tempe, Arizona 85287. For further information on admissions to Arizona State University, contact: Office of the Director of Admissions, Arizona State University, Tempe, Arizona 85287.

Advanced Credit Examinations. Advanced credit exams may be taken by persons who believe they have already taken courses required in the program. See the University requirements for "Comprehensive Examinations" on page 26 of this catalog. After a review of the student's previous work or experience and if the department's standards and appeals committee waives the course, then the student shall select as a substitute an ad-

vanced professional emphasis elective approved by the chair of the respective department. This must be done in order to complete the total semester hours for graduation. Students must carry the full semester load required for all students in the professional level programs, or file a petition for approval by the department chair for a reduced load. In either case, students must maintain a minimum of 12 semester credit hours in order to continue in a professional level program.

All advanced credit examinations must be taken before completion of the drop-add period of the semester in which the course is scheduled to be taken.

Clinical Internships. All students in the professional level programs of the College of Architecture are required to participate in a clinical internship program during the summer between the first and second professional levels by enrolling in the ASU Summer Sessions program.

A full-time clinical internship offers 3 credits. Although a student may enroll in more than one internship (subject to the availability of positions), the maximum credit permitted toward graduation is 4 credits unless the Dean of the College individually approves a special honors internship program.

Foreign Study

The College of Architecture maintains active communications with several foreign institutions offering similar professional level course work related to the various programs of this College. This opportunity is available for students who wish to pursue professional level studies at a foreign institution in lieu of resident course work for up to a maximum of one academic year. Interested students are encouraged to inform their department chair at the earliest possible date of any intentions for foreign study that may be available.

In cooperation with the University Institute of Foreign Study, current exchange programs exist with the Universitat Stuttgart, Kaplerstrasse, West Germany, and the Universidad Autonoma de Guadalajara, Guadalajara, Mexico. Other programs for foreign study and foreign exchange are currently being reviewed. Students should consult their respective department chair regarding any new affiliations. Students also may complete the clinical in-

ternship requirement in foreign architectural, planning or design sciences offices, upon the approval of the office of the Dean.

All students are encouraged to consider foreign travel and study for either a semester or an entire academic year. The individual departments reserve the right to evaluate the content and the student's competency in each of the courses completed at foreign institutions. Students may be advanced to the next level of a professional level program and complete professional level degrees without added years of academic work providing complete documentation of work accomplished is received according to a plan of study approved by the department chair and Dean prior to commencing any foreign study.

Grading

Performance in all professional level program courses is graded under the following numerical scale:

99-90	A, Distinction
89-80	B, Excellent
79-70	C, Good
69-60	D, Deficient
59 and below	E, Failing

Mark of Incomplete (I). A mark of "I" - Incomplete - may be given in required professional level courses only when a student, who is otherwise earning a passing grade, and is unable to complete all of the course work because of illness or other serious personal conditions beyond the control of the student. It is the student's responsibility to contact the instructor or the chair of the department in the instructor's absence regarding the completion requirements as set by the instructor.

The instructor of record shall submit to the department chair a "request for incomplete" form at the time the "I" mark is submitted to the registrar on the grade report. If the designated work is in a professional level program and is not thus completed within one calendar year, or within such shorter period as may be required by the instructor, the instructor shall change the mark of "Incomplete" to a failing grade. If the instructor is no longer available, the Dean may act in his place.

All incompletes in modular and sequential course work in professional level programs must be removed prior to the first day of classes for the next semester, or the student will be administratively withdrawn from the required professional level courses in which he/she may be enrolled. Readmission to these

required courses will not be considered until the next time the course(s) is offered and requires petition to and approval of the respective department Standards and Appeals Committee and the chair.

Students contemplating graduation should remove an incomplete grade no later than the graduation application date in order to qualify for certification of candidacy.

Withdrawal. The professional level programs are modular and sequential. Therefore, a student may not withdraw from one or more required professional level courses without being administratively withdrawn from all required professional level courses. All required course work of each level must be completed in sequence. Students may withdraw from the College of Architecture or Arizona State University by proper University procedures as stated on page 39 of this catalog. A mark of "W" in all professional level courses in the College of Architecture will be given if passing at the time of withdrawal and if all University procedures have been followed. Otherwise, a failing grade will be submitted to the Registrar's Office.

Examinations. A student may be excused from taking an examination only for health reasons or other serious personal conditions beyond the control of the student. Any excuse shall be submitted in writing and reviewed by the chair, in consultation with the appropriate faculty member, for approval. In unusual cases, and with the instructor's approval, a student may be allowed to take a late or special examination.

Retention Standards

To be eligible to continue in any of the College of Architecture's professional level programs, a student must successfully complete each required course in the sequence designated and maintain a numerical grade average (for the professional level courses only) of 70 or better for each semester completed. Any student is automatically designated as being on academic probation by the respective department under the following conditions:

- failure in (or to complete) any single required professional level course.
- semester grade average (for the required professional level courses only) below 70% - "C".

c. design/laboratory grade of 69 or below - "D" to "E".

d. violation of the Code of Professional Student Responsibility, admission agreement or College or departmental policies or regulations.

Continuation of enrollment shall be contingent upon such terms and conditions as determined for each individual by the respective Department Standards and Appeals Committee.

Any professional level student on a probationary status must correct all deficiencies and be eligible for removal from probation by the end of the Summer Session preceding the next level of advancement, or be subject to dismissal from the program by the department. Dismissed students may petition the Department Standards and Appeals Committee through the respective department chair for readmission. If granted, continuation in the department will be conditioned on achieving a level of performance higher than the minimum academic standards, as stipulated by the Department Standards and Appeals Committee, until all terms and conditions determined for each individual case have been satisfied and probationary status is removed.

Any failed course must be successfully completed by a student, in addition to the full course schedule, at the next time the course is offered, including Summer Sessions if available. Any failed course must be passed on the second attempt. Failure to do so will result in dismissal from the department program. No course in the College of Architecture may be repeated by any student more than once, including replacement or substitute courses.

Attendance. Required attendance at classes, laboratories, and seminars is a vital part of professional level studies and is an essential element in determining whether a student is in residence for purposes satisfying requirements for graduation. Admission to the College implies a commitment by the student to an eight hour day in the College. As a general matter, if absences are noted in a particular course, the student will be asked to confer with the respective program director or department chair; continued absence after such notification may result in a student being administratively withdrawn from the program.

Leave of Absence. Students may request a leave of absence from the College by written petition to the appropriate department chair for periods of one-year increments. Leave may

be approved for personal reasons, travel, work, or additional study in other disciplines. Students on leave must make written request to the appropriate department chair for readmission prior to July 1 for the Fall Semester of the year of return to the program or December 1 for the Spring Semester, in order that a space may be reserved.

Student Projects. The College of Architecture reserves the right to retain any or all student projects for the College's future use.

Pre-Professional Studies

Rushia G. Fellows, Director

General Information

Students interested in pursuing studies in Architecture, Design Sciences and Planning (and their separate professional level programs, and areas of concentration offered within the College of Architecture at Arizona State University), should contact the Director of Admissions, Arizona State University, Tempe, Arizona 85287. If qualified for University admission, students will be admitted to the College of Architecture in a pre-professional status. In this status, students will enter into a two-year course of preparatory studies as outlined in the separate options available.

The College of Architecture provides pre-professional advisement for all students. Contact the Academic Advisor, Architecture Annex, College of Architecture for information and appointments.

Option "A" Architecture/Design Sciences/Planning Pre-Professional Studies

Minimum Requirements. This option prepares students for admission to one of the following majors: architecture, design science, housing and urban development, industrial design, interior architecture, urban planning; or course work concentrations within one of the above majors relating to: architecture/engineering, landscape architecture, city planning.

Pre-Professional Studies. Preparatory work may be completed in the ASU College of Architecture pre-professional studies program by completion of the ASU courses listed below, or equivalent courses at other accredited institutions, including community colleges.

150 PRE-PROFESSIONAL STUDIES

Four semesters or equivalent is the minimum required preparation.

Curriculum Content

English (6 Sem. Hrs.)

	<i>Semester Hours</i>
ENG 101, First Year English	
102** (or ENG 104, 3)	6

Humanities (10 Sem. Hrs.)

COM 300 Group Communications	3
DES 100, Introduction to Architecture,	
101 Design Sciences and Planning, I, II	4

Electives (lecture course only in architecture, art, communications, dance, English, foreign languages, humanities, music, philosophy, religious studies, or theatre) 3

Social and Behavioral Sciences (9 Sem. Hrs.)

ECN 201 Principles of Economics	3
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Electives (lecture courses only in anthropology, criminal justice, economics, cultural geography, history, psychology, sociology, or political science) 6

Science and Mathematics (21 Sem. Hrs.)

MAT 115 College Algebra and Trigonometry (or MAT 117 and MAT 118)	4
MAT 260 Calculus for Applied Sciences, or MAT 142 Mathematical Analysis QBA 221, Statistics (or any approved statistics course) or MAT 226	6

(will accept two courses in calculus if total credits met)

ECE 102***Introduction to Engineering	2
PHY 111, General Physics I	
PHY 112 General Physics II, or Physical or Biological Science elective (biology, chemistry, geology, or physical geography only)	3
CSC 183 Programming in Fortran (or equivalent basic computer programming course)	3

Design History and Theory (6 Sem. Hrs.)

DES 200, History of Human	
201* Environment I, II	6
or	
DES 313, History of Western Architecture	
314* I, II (6) or DEH 474, 475 History of Interior Furnishings I, II	(6)

Design Fundamentals and Communications (13 Sem. Hrs.)

DES 141 Design Graphics	2
142 Design Graphics Lab	1
DES 160, Sketching and Rendering I, II	4
161	
DES 221, Design Fundamentals I, II	6
222	
Minimum Total Semester Hours	62-65
	(62 if ENG 104 taken)

Option "B" Architecture/Engineering

Pre-Professional Studies

Minimum Requirements. For students in the Engineering Sciences, preparing for sequential Bachelor of Architecture and Master of Science (Civil Engineering) degrees, or for students pursuing related design sciences, emphasizing a more extensive preparation in mathematical and physical sciences.

Pre-Professional Studies. Students seeking to complete the sequential Bachelor of Architecture and Master of Science (Civil Engineering) degree programs, focusing on building design and structures, shall consult the Pre-Professional Academic Advisor for approved course work.

This six-year program (two years pre-professional, three years of architecture at the professional level, and one year of engineering at the graduate level), provides students completing this curriculum with the basic educational requirements generally required for State Registration in both Architecture and Structural Engineering.

Individual students wishing to pursue a special engineering oriented design sciences program should contact the Chair, Department of Design Sciences, for advising and approval of their particular pre-professional and professional level programs.

Curriculum Content

English (3 Sem. Hrs.)

ENG 102** First Year English	3
(or ENG 104) (3)	

Humanities (4 Sem. Hrs.)

DES 100, Introduction to Architecture,	
101* Design Sciences and Planning I, II	4

Remaining hours required by the University are satisfied by design history and theory

* ** *** See course substitutions, page 151.

Social and Behavioral Sciences (6 Sem. Hrs.)

ECN 201	Principles of Economics	3
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Electives (lecture courses only in anthropology, criminal justice, economics, cultural geography, history, psychology, sociology, political science)

Mathematics and Sciences (34 Sem. Hrs.)

MAT 290,	Calculus I, II	10
ECE 380	Differential Equations	3
ECE 383	Probability and Statistics	2

Engineering Core (13 Sem. Hrs.)

ECE 102***	Introduction to Engineering	2
PHY 115,	University Physics	5
ECE 210	Engineering Mechanics I/Statics ..	3
ECE 312	Engineering Mechanics II /Dynamics	3
ECE 313	Intro. to Deformable Solids	3
CSC 183	Programming in Fortran	3

(or equivalent basic computer computer programming course)

Design History and Theory (6 Sem. Hrs.)

DES 200,	History of Human Environment I.	
201*	II or	6
DES 313,	History of Western Architecture	
314*	I, II	

Design Fundamentals and Communications (13 Sem. Hrs.)

DES 141	Design Graphics	2
DES 142	Design Graphics Lab	1
DES 160,	Sketching and Rendering I, II	4
DES 221,	Design Fundamentals I, II	6
DES 222		

Minimum Total Semester Hours 66-69
(66 if ENG 104 taken)

*, **, *** See course substitutions, below.

Course Substitutions

Exceptions and alternative course substitutions for certain students and those completing an equivalent program at another institution are to be approved in writing by the academic advisor. Refer to Options "A" and "B" above.

*DES 100, 101 Introduction to Architecture Planning and Design I, II and DES 200, 201 History of Human Environments I, II or DES 313, 314 History of Western Architecture may be replaced by ten (10) hours of lecture

courses only in art history or theory, architecture history, or history electives if completing requirements at institutions other than ASU.

**ENG 101, 102 First Year English I, II may be replaced by ENG 104 and an English or literature elective by students who pass an exemption examination.

***ECE 102 Introduction to Engineering may be replaced by two semester hours of additional credit in science methods in a basic biological or physical science course (biology, chemistry, geology, or physical geography only) if completing requirements at institutions other than ASU.

Pre-Professional Design Lecture and Laboratory Courses

The lecture courses numbered DES 100, 101, 200, 201, 313, 314 in design history and theory, and the laboratory courses numbered DES 141, 142, 160, 161, 221, 222 in design fundamentals constitute a block of instruction offered by the College of Architecture to augment other required course work in general and liberal studies. The design fundamentals courses provide preparatory instruction for basic visual design theory and technique necessary for all professional level studies.

DESIGN HISTORY AND THEORY
(Open to all University students)

DES 100 Introduction to Architecture, Design Sciences and Planning I. (2) F, S
Understanding our physical environment through the forms, functions and determinants of society, its continuity with the past and its relation to the developing present.

101 Introduction to Architecture, Design Sciences and Planning II. (2) F, S
Career preparation for the related design professions.

200 History of Human Environments I. (3) F
Representative works of western and eastern designed environments, including artifacts, products, technological devices, furnishings, buildings, and the development of the city through the medieval period.

201 History of Human Environments II. (3) S
Designed human environments, including their technology and components from the Renaissance to the present day, as represented by western and eastern cultures.

313 History of Western Architecture I. (3) F
Representative works of western architecture, ancient through medieval.

314 History of Western Architecture II. (3) S

Architecture of the Renaissance to the end of the 19th century.

DESIGN FUNDAMENTALS

(Restricted to students admitted to the College of Architecture Pre-Professional Program.)

DES 141 Design Graphics. (2) F, S, SS

Elements of orthographic and axonometric projection; perspective, shades and shadows; charts and graphs; photographic theory, graphical mathematics; introduction to basic descriptive geometry for designers.

142 Design Graphics Lab. (1) F, S, SS

Application of photography relating to graphical presentation. Two nine-week sessions per semester.

160 Sketching and Rendering. (2) F, S, SS

Free-hand sketching and rendering; light and shade, two point perspective. Quick visual presentations of objects and concepts.

161 Sketching and Rendering II. (2) F, S, SS

Reinforcement of quick rendering; fundamentals of perspective, color in various media applied to rendering techniques, and line drawing. Prerequisite: DES 160

221 Design Fundamentals I. (3) F

Laboratory experiments in spatial organizational systems, 2-D and 3-D composition, human scale and motion, form and color; leading to an understanding of the esthetic, technical and human objectives of the environmental, design professions.

222 Design Fundamentals II. (3) S

Continuation of DES 221. Prerequisite: DES 221

Advanced Undergraduate Course Work

These courses are open to all advanced undergraduate and professional level students in the College of Architecture. These courses may be open to any student in the University upon approval of the instructor.

DES 348 Theory of Built Environment. (3) N

Intensive study of built environmental forms, their theoretical foundation and relations to social processes.

Prerequisite: Advanced undergraduate or professional level students in the college, or approval of the instructor.

AVC 382 Water Color. (2) F, S

Painting in transparent water color. Emphasis on technique, composition and color as they relate to various subjects and their environment studio.

Department of Architecture

PROFESSIONAL LEVEL PROGRAM

Roger L. Schluntz, Chair

General Information

The professional program in architecture, culminating in the first professional degree, Bachelor of Architecture, normally requires a minimum of 111 semester hours, three years of study beyond the pre-professional (or equivalent) requirements.

Presently under discussion is a proposal for a first professional Master of Architecture degree which would normally require four years of study beyond the pre-professional two-year course. For detailed information about the current B.Arch. degree and initiation dates concerning the M. Arch. degree, contact the Department of Architecture for the separate College of Architecture Bulletin.

Admission: Students interested in pursuing this degree should complete the two-year pre-professional preparatory program of the College of Architecture, or a similar two-year program of studies at another institution. Successful completion of these requirements does not ensure admission into the professional level program (See Application Procedures, page 145). Students currently enrolled in the professional level program under the 1979-81 University *General Catalog*, and who successfully complete the current three-year professional level program in architecture, will receive the Bachelor of Architecture (first professional) degree. Once this degree is phased out in lieu of the proposed M. Arch. degree, the Master of Architecture degree will be the only professionally accredited degree in architecture offered at ASU.

Transfer Students: Students currently studying at other institutions are normally considered for admission to the Bachelor of Architecture degree program only at the beginning of the second or third professional level in the program sequence.

For more specific information, contact the Chair, Department of Architecture. Because of space limitations, admission into the professional program of architecture is on a competitive basis.

Program Objectives

The professional level program in architecture is directed toward providing students access to the knowledge and skills necessary for a future practice in architecture. This professional level program of study requires that students have previous course work in the humanities and liberal arts, and assumes that degree candidates will continue their general education to obtain a broad understanding of society and its needs relative to the built environment. The program seeks to enhance the desire for learning and the development of a capacity for independent research, critical thinking and judgment necessary for the future professional.

The curriculum combines integrated lecture, studio and laboratory course work involving both individual and team experiences, and is designed as a fundamental resource for admitted students in their quest for successful careers in architecture.

Organization and Instruction

The Department of Architecture's professional level program is organized by the faculty under the direction and administration of the chair. Subject matter within the department is categorized in the following instructional areas:

Architectural Administration and Management. (AAD) develops the organization and managerial aspects of architectural practice. These studies examine the overall processes relative to management coordination, administrative procedures, ethics, legal constraints, and the economics of architectural practice.

Architectural Design and Technology Laboratories (ADE) encourage synthesis of the knowledge and understanding the student has gained from previous and parallel course work and from other sources toward the comprehensive design development of architectural projects. The laboratories integrate the needs, limitations and determinants of design problems; applying analytical methods and technical skills in seeking and comparing alternative solutions for assigned problems.

Architectural Philosophy and History (APH) develops an understanding of architecture as both a determinant and a consequence of man's culture, technology, needs and behavior

in the past and present. These studies are concerned with the rationale for the methods and results of design and construction.

Architectural Technology (ATE) develops knowledge of the technical determinants, resources and processes of architecture. These studies are concerned primarily with the science and technology of design and construction; including materials, building systems, acoustics, lighting and structural systems and solar systems considerations, both passive and active.

Environmental Analysis and Programming (ANP) develops capabilities to analyze and program environmental and human factors as preconditions for architectural design. These studies are concerned with the existing and emerging evaluation and analytical methods used by the profession.

Architectural Communications (AVC) provides the student with an opportunity to develop and reinforce visual communication methods in special areas, such as graphics, communications and design.

Architecture and Community Housing (ACH) develops an understanding of housing environments as a special type of architectural and urban planning problem.

Special Studies (ARP) provides students with residency and off-campus opportunities and educational experience in group and individual studies relative to specific student interest and faculty expertise.

A summer clinical internship in an architect's office under the direction of an approved preceptor and licensed practitioner is required and provides a distinct educational experience. A special honors internship with nationally and internationally distinguished firms is also available for professional emphasis credit. This requires a separate application to and selection by the College.

The program also provides various required and optional field trips. (Supplemental fees are assessed for these offerings.) In addition, several foreign study opportunities are available for honor students.

Professional Emphasis Elective Course Work

Each student must complete the required professional elective course work from the following or approved emphasis areas:

154 ARCHITECTURE COURSES

Architectural Office Management

(Also courses in the College of Business Administration.)

Construction Technology and Administration

(Also courses in the Division of Construction.)

Landscape Architecture

(Also courses in the Departments of Planning, Botany/Microbiology and Division of Agriculture.)

Structural Systems Design

(Also courses in the College of Engineering and Applied Sciences.)

Architectural History and Preservation

(Also courses in art history, College of Fine Arts.)

Environmental Research, Analysis and Programming

(Also courses in the Department of Psychology.)

Solar Design and Technology

(Courses in the Department of Planning and in the College of Engineering and Applied Sciences.)

Energy Conservation/Adaptive Reuse

(Also courses in the Department of Planning.)

Housing and Urban Development

(Also courses in the Department of Planning.)

Urban and Regional Planning

Environmental Psychology and Sociology

Interior Architecture

Computer Aided Design

Architectural History and Theory

Advanced Architectural Communications



Architecture

PROFESSIONAL LEVEL PROGRAM

PROFESSORS:

SCHLUNTZ (ARCH 140), ELLNER,
HERSHBERGER, OLIVER, PETERSON, RAPP,
WHIFFEN

ASSOCIATE PROFESSORS:

HINSHAW, JAKOB, RUMMELL, SCHEATZLE,
SHEYDAYI

ASSISTANT PROFESSORS:

BERTELSEN, CHRISTENSEN, PERRELL

PROFESSOR EMERITUS:

STRAUB

General Studies Courses

These courses are open to any student of the University meeting the stated pre/co-requisites and recognized in other colleges' programs of General Studies.

ARCHITECTURAL ADMINISTRATION AND MANAGEMENT

AAD 551 Architectural Management I. (3) F

Advanced professional management methodology and techniques, including organizational legal and economic aspects of professional practice. Office organization, personnel policies, organizing and managing the production team, scheduling, production budgeting and control.

552 Architectural Management II. (3) S

Advanced production and professional management, including bookkeeping and cost accounting, record keeping, "fast track" production methods, comprehensive services, advanced production techniques. Selection, negotiations and contracts with outside consultants and clients, cost-based compensation and techniques of liability loss prevention.

553, 554 Construction Administration I, II. (3) F, S

See PUD 441 and 442

555 Architect as Developer. (3) F, S

Development building, real estate, construction funding, land acquisition and the sources for capital

ARCHITECTURAL PHILOSOPHY AND HISTORY

APH 300 World Architecture. (2) F, S

Exploration of historical and contemporary built environments of world civilizations as manifestations of cultural history and responses to environmental determinants.

304 American Architecture. (3) N

Architecture in the U.S. from earliest colonial times to present.

305 Contemporary Architecture. (3) N

Europe and America from the foundations of the modern movement to the present.

414 Baroque Architecture. (3) N

Europe and America from the late 16th to the middle 18th century. Prerequisite: DES 214.

417 19th Century Architecture. (3) N

Europe and America from neoclassicism to art nouveau. Prerequisite: DES 214.

ARCHITECTURAL TECHNOLOGIES

ATE 563 Soil Mechanics and Foundations. (3) S

Soil characteristics, elementary soil mechanics, survey of site exploration and lab testing, bearing foundations and retaining structures. Prerequisite: ATE 361 or approval of instructor.

ENVIRONMENTAL ANALYSIS AND PROGRAMMING

ANP 433 Building Codes and Ordinances. (3) F, S

See PUD 433.

477 Computer Applications to Environmental Design Problems. (3) F, S

Use of existing computer programs to solve environmental and design problems. Topics include graphics, mapping, structures, regional analysis, time management and energy analysis.

ARCHITECTURAL COMMUNICATION

AVC 410 Architectural Presentation Techniques. (3) F, S

Special techniques of graphic communications as preliminary presentation tools for the design professional. Prerequisite: AVC 301 or approval of instructor.

ARCHITECTURE AND COMMUNITY HOUSING

ACH 476 Community Housing. (3) F

History, practices, trends, and forms of housing; includes growth of public programs, national and local programs, zoning law, housing distribution, planning principles and policies, design review, standards and private development practice.

477 Housing Environments. (3) S

Contemporary housing environments, housing types and life styles as determined by user preference, density, development and property standards, cost, community and privacy, security, identity, movement and the need for open space.

Professional Level Program Courses

The following courses are restricted to students admitted to the professional architectural program and, with permission, other professional and graduate students of the College of Architecture.

ARCHITECTURE PHILOSOPHY AND HISTORY

APH 313 Ancient Architecture. (3) N

The ancient Mediterranean world, with selective emphasis on major historical complexes and monumental styles

314 Renaissance Architecture. (3) N

Europe and America in the 15th and 16th centuries. Prerequisite: APH 313.

415 20th Century Architecture I. (3) F

Architecture in Europe and America from the foundations of the modern movement to the culmination of the international style.

416 20th Century Architecture II. (3) S

Developments in architecture since the international style. Prerequisite: APH 415.

ARCHITECTURAL ADMINISTRATION AND MANAGEMENT

AAD 560 Professional Practice I. (3) F

Economic and contractual aspects of professional practice including finance sources, project funding, partnerships, corporate practice, insurance, and administration of building contracts. Prerequisite: ARP 484.

562 Professional Practice II. (3) S

Legal and management aspects relating to professional practice, including legal responsibilities and liabilities, management of time and people, and accounting and marketing services. Prerequisite: AAD 560.

ARCHITECTURAL DESIGN AND TECHNOLOGY LABORATORIES

ADE 321 Architectural Design/Process Determinants.

(3) F

Fundamentals of architectural design, problem-solving techniques and the design process, investigation, analysis, synthesis and development of design projects. Lecture, lab, and field trips.

322 Architectural Design/Environmental Determinants.

(5) S

Application of comprehensive environmental determinants toward resolving human habitation needs. Emphasis on site, climate and other external factors. Lecture, lab and field trips. Prerequisite: ADE 321.

421 Architectural Design/Human and Behavioral Determinants. (5) S

Emphasis on the design of community facilities, user needs and activities. Man and his behavior as a primary architectural determinant. Lecture, lab and field trips. Prerequisites: ADE 322, ARP 484.

422 Architectural Design/Social Determinants. (5) S

Programmatic and comprehensive development of multi-building complexes relating to community, cultural and urban services. Emphasis on societal needs and expectations. Lecture, lab and field trips. Prerequisite: ADE 421.

434 Architectural Design Options. (5) S

Selected design options offered by each section of this course to include comprehensive architectural design and technology of various complex building types. Prerequisite: approval of instructor and chair.

521 Architectural Design/Urban and Spatial Determinants. (5) F

Comprehensive design with emphasis on medium-rise structures in the urban context. Form as a design determinant. Lecture, lab and field trips. Prerequisite: ADE 422.

522 Architectural Design/Building Systems. (5) S

Comprehensive design of multi-story structures. Analysis of building systems as form determinants. Economic feasibility studies of commercial buildings. Lecture, lab and field trips. Prerequisite: ADE 521.

156 ARCHITECTURE COURSES

ARCHITECTURAL TECHNOLOGIES

ATE 351 Environmental Control Systems I. (3) F

Architectural design implications of solar radiation, heat and moisture transfer. Trends in environmental control and energy-conscious design. Passive techniques to heat, cool and light.

352 Environmental Control Systems II. (3) S

Architectural design implications of HVAC systems. Heating and cooling loads, psychometrics, the refrigeration cycle, air/water distribution, control systems, energy performance standards, plumbing and sanitary systems. Prerequisite: ATE 351 or approval of instructor.

353 Architectural Construction I. (3) F

Basic materials and methods of architectural construction for residential scaled systems. Includes effect of zoning and code requirements.

361 Building Structures I. (3) S

Statics, dynamics and strength of materials. Elasticity of structural materials, properties of sections, elastic stress analysis of determinate structures, computer applications. Preliminary design of simple structural systems.

362 Building Structures II. (3) F

Analysis and design of wood and masonry structural systems and connections. Lateral analysis and design, utilizing shear walls and diaphragms in small structures. Prerequisite: ATE 361.

451 Architectural Construction II. (3) F

Selection and employment of materials and systems according to their nature and the techniques of their use, and basic construction cost estimating procedures for architects. Prerequisite: ATE 354.

456 Architectural Construction III. (3) S

Selection and employment of appropriate materials and systems for commercial scaled facilities. Includes effect of zoning and code considerations. Basic construction cost estimating procedures. Prerequisite: ATE 451.

461 Building Structures III. (3) S

Analysis, design and detailing of steel buildings and frames. Lateral analysis of small rigid and braced frame systems. Prerequisite: ATE 362.

462 Building Structures IV. (3) F

Analysis, design and detailing of concrete systems, considering continuity, multi-story frames and shear walls, and lateral analysis. Computer application of existing programs. Prerequisite: ATE 461.

488 Building Structures V. (3) S

New developments in high rise structural systems. Effects of wind and seismic forces. Preliminary analysis, design and detailing of tall buildings using code requirements and computer applications. Lecture/lab. Prerequisite: ATE 462.

551 Advanced Building Systems. (3) F

Techniques of analysis for determining appropriate passive and active methods of year around environmental control. Case studies and economic analysis of energy-efficient buildings. Prerequisite: ATE 352.

553 Building Systems I. (3) F

Technical problems of climate control, acoustics, lighting, communications and other mechanical and electrical systems. Prerequisite: ATE 352.

557 Construction Documents I. (3) F

Production of architectural working drawings; legal status organization, layout, site survey plans, sections, elevations, details, schedules, and coordination. Laboratory/lecture.

558 Construction Documents II/Specifications and Cost Analysis. (3) S

Coordination of working drawings with preparation of construction specifications and cost estimates. Emphasis on alternative methods and office procedures. Contract conditions, bonds, and bidding procedures. Prerequisite: ATE 557.

582 Building Systems II. (3) S

Continuation of previous work with technical problems with emphasis on mechanical and electrical systems. Prerequisite: ATE 553.

587 Building Systems III. (3) F

Principles of planning and design of appropriate environmental control, structural, vertical transportation and fire protection systems for high rise and large building complexes. Prerequisites: ATE 352, 582.

ENVIRONMENTAL ANALYSIS AND PROGRAMMING

ANP 331 Environmental Analysis and Programming. (3) F

Analysis of the natural and human environmental determinants as the basis of the programming and design of the built environment. Emphasis on site and climate analysis and landscape/space theory.

431 Facility Programming and Methods. (3) F

Programming and design methodologies, including problem seeking, goal identification, code search, observation, questioning, descriptive statistics, relationship diagrams, brainstorming, space allocation, and simulation as techniques for processing information for building design.

442 Site Planning Principles and Analysis. (3) S

Effects of topography, climate, energy, zoning and landscaping upon design development of external spaces. Programming and analysis, and integration of architectural design to the site and site to the region.

481 Urban Structure and Design. (3) F

The nature and dynamics of urbanization and its relationship to architecture and urban design; including growth, decay, socialization, planning processes, and visual perception. Case studies.

535 Building Programming. (3) F

Design problem definition including client interviews, literature review, user needs analysis, existing building evaluation, and program preparation. Prerequisite: Third Professional Level in Architecture or approval of instructor.

ARCHITECTURAL COMMUNICATION

AVC 301 Architectural Communication I. (2) F

Basic graphic skills, drawing conventions, values, graphic symbols and lettering, sketching and presentation vocabulary. Two afternoons in laboratory per week. Lecture and field trip.

302 Architectural Communication II. (2) S

Continuation of AVC 301. Introduction to theory and effects of color. Prerequisite: AVC 301.

SPECIAL STUDIES

ARP 451 Architecture Field Studies. (1-6) F, S, SS
Organized field study of architecture in specified national and international locations. May be repeated with approval of chair.

484 Clinical Internship. (3) SS
Full-time internship under the supervision of practitioners in the Phoenix area or other locales.

Special Courses: APH, ANP, ATE, ADE, AAD, ARP, AVC --294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. See pages 32-33. Also consult University Continuing Education brochures for special course offerings

Department of Design Sciences

PROFESSIONAL LEVEL PROGRAMS

Tom Witt, Chair

Purpose

Professional designers work within areas requiring an understanding of systems, functions, scientific and technical processes including human factors. They must also integrate esthetic considerations into the products and spaces for which they design.

The Department of Design Sciences serves professional level programs of study in industrial design, interior architecture, and design science.

The programs of study within Design Sciences are scheduled for full-time students. Certain emphases and program options within the major of Design Sciences, however, will allow for part-time student participation and study. The professional level design curricula concentrate and combine fully-integrated lecture, laboratory, and studio course work involving both individual and team experiences. The curricula are further directed at providing students the skills and facilities required for the practice of design or design-related careers.

All programs assume each student has previously acquired a broad foundational education and provides for applications of this preparatory education. The program thrust is toward acquiring competency in professional skills in a rapidly changing and increasingly competitive technological society.

One summer of clinical internship in design-related activities under the direction of an approved preceptor is required and provides a distinct educational experience.

Organization

The professional level programs within the Department of Design Sciences are organized under the direction of the chair, and are administered by program coordinators representing each designated program of study. The Department of Design Sciences offers the following programs of study (major):

Industrial Design
Interior Architecture
Design Science

Professional Level Curricula Bachelor of Science in Design

A student seeking the Bachelor of Science in Design degree within the Department of Design Sciences must satisfactorily complete a minimum planned curriculum of 69 semester hours beyond the 65 hours of pre-professional core requirements. The major categories of course work are classified as follows:

Industrial Design (IND) identifies course work primarily utilized by the program majors in industrial design. Courses with this prefix include interdisciplinary design methodology and problem solving related to planning and form, giving experiences that involve synthesis of design knowledge gained from all other major course work.

Interior Architecture (INT) identifies course work primarily utilized by the program majors in interior architecture. Courses with this prefix include design methodology, planning, and studio experiences that involve synthesis of design knowledge gained from all other major course work.

The program also provides various required and optional field trips. (Supplemental fees are assessed for these offerings). In addition, several foreign study opportunities are available for honor students.

Industrial Design

Industrial design is primarily concerned with how humans perceive and use man-made objects, and has been defined as the professional service of creating and developing concepts and specifications that optimize the appear-

ance, function, and value of products and systems for the mutual benefit of both the user and the manufacturer.

This service is often provided in the context of a cooperative working relationship with other members of a development group. The industrial designer's contribution places special emphasis on human characteristics, needs, and interests which require particular understanding of visual, tactile, safety, and convenience criteria. Industrial designers combine these considerations with practical concern for technical processes and requirements for manufacture; marketing opportunities and economic constraints; and distribution, sales, and servicing arrangements.

The Industrial Design program of the Department of Design Sciences has developed a two-year professional level program which emphasizes the product design process. Student admittance to this program is subject to the application and admissions procedures found on pages 145-147.

Structure and Purpose. The Industrial Design program is structured so that students divide each day between the design studio and supportive courses in esthetics, human factors, mechanical and material technologies. The design studio is taught by a faculty team and allows each student to experience a professional environment. Studio projects anticipate and promote an interdisciplinary approach to solving design problems. Students begin by developing an intellectual base which is concerned with the history, philosophy and direction of industrial design. Studio problems proceed from small consumer products with simple task functions to larger and more complex forms and systems.

Student designers progress through the total product design process which includes: problem analysis and statement, concept ideation, final product development, presentation and packaging.

Former graduates have accepted entry level positions for product design and packaging in the following areas: consumer products, transportation, electronics, medical devices and health products, recreational products, and materials application.

**Professional Level Studies—
Required Courses**

Industrial Design

		First Professional Level (Third Year)		
Fall				<i>Semester Hours</i>
IND	360	Design Methodology and Techniques	5	
IND	352	Human Factors in Design	3	
IND	340	Color	3	
IND	342	Color Sketching	3	
IND	350	Materials	<u>3</u>	
				17
Spring				
IND	361	Concept Development	5	
IND	440	Plastics Design	2	
IND	494	Photo/Design Technique	3	
IND	494	ST: Material Processes	3	
IND	443	Value Analysis	<u>2</u>	
				15
Summer				
IND	484	Internship	3	

Second Professional Level (Fourth Year)

Fall				
IND	460	Unit Analysis and Design	5	
IND	450	Design Project	3	
IND	484	ST: Mechanics of Materials	4	
IND	420	Graphics Design and Packaging .	3	
IND	400	Professional Practice	<u>3</u>	
				18
Spring				
IND	461	Systems Synthesis and Design	5	
IND	451	Design Project	3	
IND	441	Product Liability	2	
IND	421	Advanced Packaging Design	3	
		Approved Professional Elective	<u>3</u>	
				16
Total Credit Hours				
		Pre-professional Studies	65	
		Professional Level Program	<u>69</u>	
				134

Interior Architecture

The professional activities of the interior architecture graduate have expanded during the last two decades to address more complex and dynamically changing social-environmental situations.

In collaboration with allied professions, interior architects and designers are now in the unique position to respond to man's needs. As

a young and dynamic profession, it is assuming an increasingly broader commitment to society in humanizing man's leisure, living and working spaces.

The program is structured with the primary mission to educate designers who will be qualified to assume responsible leadership roles in the continuing growth of the profession, and in the improvement of the quality of man's immediate environment by constructively relating the design process to man's life process.

Graduates from the program are qualified to practice interior architecture and design in a variety of specialized areas. These include institutions, corporations, sales, space planning, architecture offices, industry and government. Students expecting to pursue graduate studies will also be prepared to develop advanced specializations in related professional areas.

**Professional Level Studies—
Required Courses**

Interior Architecture

First Professional Level (Third Year)

Fall	<i>Semester Hours</i>
INT 360 Human Habitation Space Design	5
INT 320 Interior Architectural Rendering	3
IND 352 Human Factors in Design	3
ATE 353 Architectural Construction I	3
INT 468 Interior Architectural Lighting ...	<u>3</u>
	17

Spring	
INT 361 Community Space Design	5
INT 355 Interior Architectural Construction	3
INT 321 Interior Architectural Construction Documents	3
INT 494 ST: Programming for Space Planning	3
INT 465 Interior Architectural Acoustics ..	<u>3</u>
	17

Summer	
INT 484 Clinical Internship	3

Second Professional Level (Fourth Year)

Fall	
INT 460 Commercial Space Design	5
INT 440 Interior Materials Performance Criteria I	3
INT 442 Professional Practice I	3

ATE 352 Environmental Control Systems II	3
INT 494 ST: History of Interior Architecture and Design I	<u>3</u>
	17

Spring

INT 461 Institutional Space Design	5
INT 441 Interior Materials Performance Criteria II	3
INT 443 Professional Practice II	3
INT 455 Advanced Environmental Control Systems	3
INT 494 ST: History of Interior Architecture and Design II ...	<u>3</u>
	17

Total Credit Hours

Pre-professional Studies	65
Professional Level Program	<u>71</u>
	136

Design Science

Design Science as a primary program of study combines those areas of concentrations in design studies that are generally more interdisciplinary in program construction and have a stronger technical and science bias. Depending upon the concentration area followed, additional course work is substituted in place of the professional level laboratory requirement. Otherwise the program requirements, including the total number of hours required for graduation, is the same as in all other programs within the department including the two-year Pre-Professional Studies in Option "A". Specific requirements are to be determined and approved in consultation with the chair of Design Sciences and a faculty member representing the proposed related area of concentration.

The design science program has developed certain distinct concentration areas which are typical but not intended to be exclusive: packaging design, production design, technical management, solar equipment design, computer-aided design and human factors in design.

Packaging Design Concentration. This undergraduate concentration develops disciplines relevant to the major divisions of package design activity. The marketing, graphics and art-related subjects emphasize those areas of need in the consumer packaging field, where marketing, advertising, sales and product esthetics are vital to the package's role as a silent salesman. On the other hand, the technical, structural and distribution sys-

tems-related subjects emphasize those areas of need for the industrial or distribution package designer, where shock, vibration, physical protection and systems integration roles of the package are emphasized.

Production Design Concentration. The production designer is primarily concerned with the functional aspects of consumer products, industrial products, production equipment and material handling equipment. A prime objective in this design discipline is to optimize considerations of function, cost, energy consumption, efficiency, safety, human factors, durability, and material utilization justified through "state of the art" applied science and supported by appropriate computation. Professional level course work requires preparation in mathematics, basic science, communication (written, oral and graphic) and the historical and social perspective of the profession. Applied science courses in mechanics (both solid and fluid), materials, thermodynamics, electricity, and machine design prepare the graduate for creative design of machinery for industry and the consumer marketplace.

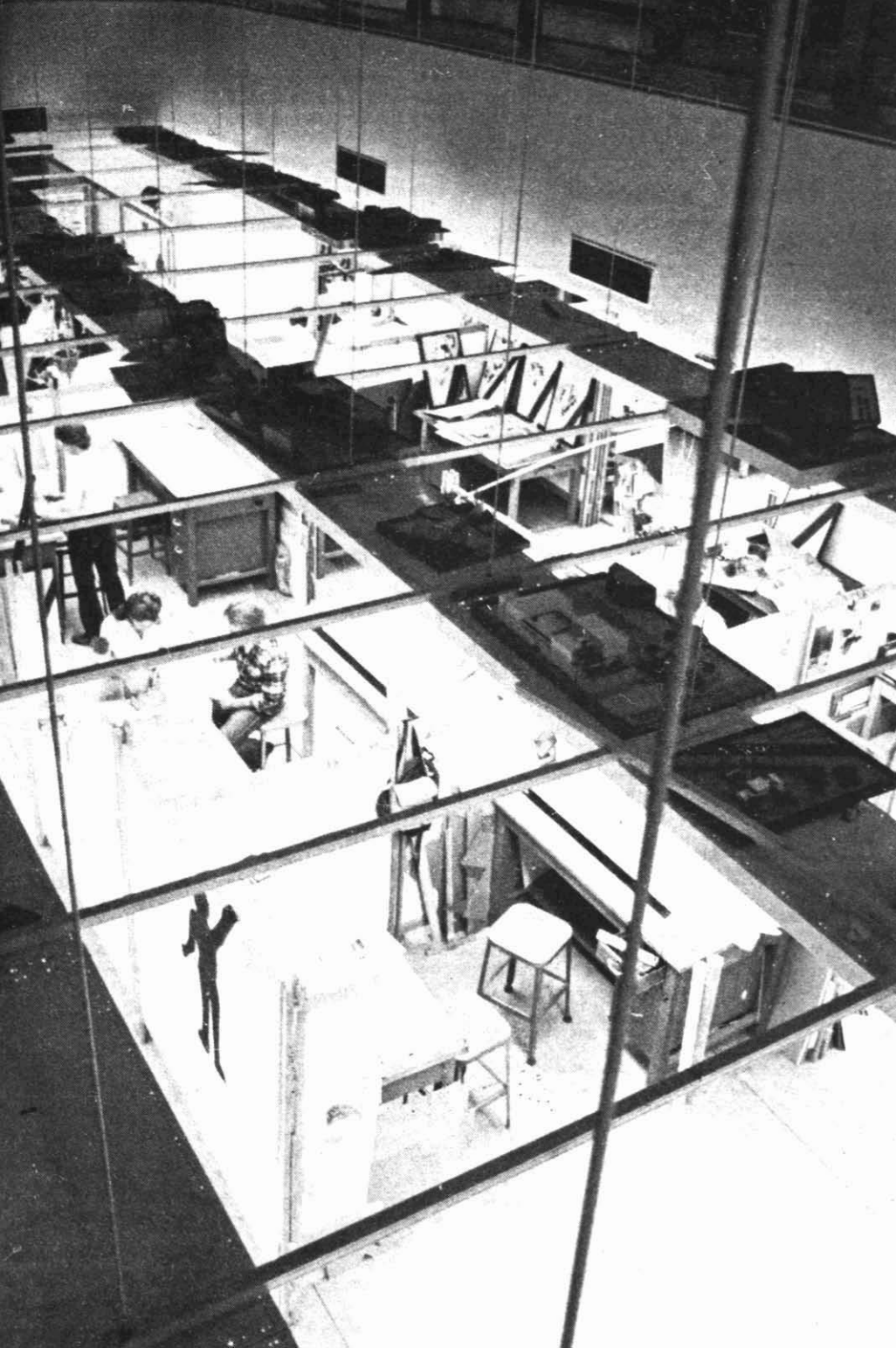
Technical Management Concentration. The primary objectives of the technical management field of specialization are: 1) preparation for entry level positions leading to policy level management in manufacturing/production enterprises, and 2) satisfactory completion of Master of Business Administration entrance requirements. This field requires a basic background in mathematics, applied science and production design; basic business tools and skills, and an understanding of business procedures; and an area of emphasis in design, value analysis, management or marketing. Other areas of concentration may be elected with the approval of the Department of Design Sciences. The management concentration will consist of 24 semester hours structured to attain entry level capability in such areas as design, product planning, product value analysis, industrial sales, product service, industrial purchasing, budget administration, production management, etc. The specialization is constructed with approximately 20 percent each in business, design, mathematics and applied sciences, communication and general studies, and an elected area of emphasis. Technical management will be of interest to students seeking management in a product

producing industry where understanding of the technical aspects of product or production is essential.

Human Factors Concentration: In recent decades man-made products and systems have reflected a significant emphasis on placing greater reliance upon systematic research as the basis for developing principles and data to be applied in human factors design. As a result, there is a growing need for design practitioners who possess in-depth knowledge of human factors process and application. The independent study program allows the qualified student to develop a program of study which anticipates and supports the various components that provide a basis and structure for human factors design. These would include: industrial design, statistical analysis, bio-mechanics, behavioral psychology and other selected subjects.

Solar Equipment Design Concentration: Utilization of solar energy has opened a professional field for an unique design specialist. Continued research and development in more direct conversion of solar energy to society's usage is assured and will provide expanding opportunities for the designer prepared to address the challenge. The solar designer must have a fundamental knowledge of the physics, geography, and meteorology which define and limit solar radiation together with the ability to design practical hardware with current materials, manufacturing processes, realistic economics and proven mechanical and structural performance standards. This professional objective is achieved through combining course work in physics, mathematics, mechanics (solid and fluid), manufacturing materials/processes, design of machinery, thermodynamics/heat transfer, solar energy, and energy systems. This concentration is offered through the cooperation of the Department of Planning, which is responsible for the College's energy planning and technology course work.

Computer Graphics Concentration: The computer graphics emphasis will provide the student with a working knowledge of computer-aided design (CAD) as it applies to industrial design. Plans and evaluations of products may be digitized into the graphics system. Perspectives, rotations, stacking and



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scaling routines enable the designer to see the proposed product from many viewpoints instantly.

Design Sciences

PROFESSIONAL LEVEL PROGRAMS

PROFESSOR:
REZNIKOFF

ASSOCIATE PROFESSORS:

WITT (Arch 141), ADAMS, BENZINGER, BUSH, KNIGHT, KROELINGER, NIELSEN

ASSISTANT PROFESSORS:

QUESADA, SADLER

VISITING CLINICAL PROFESSOR:

SHIPLEY

General Studies Courses

These courses are open to any student of the University meeting the stated pre/co-requisites and are recognized in other colleges' programs of General Studies.

INDUSTRIAL DESIGN

IND 350 Materials. (3) N

Materials application in design. Characteristics and properties of ferrous and nonferrous metals, plastics and elastomers.

352 Human Factors in Design. (3) N

Man-machine environment systems; human characteristics and behavior applied to design of products, systems and their operating environment.

441 Product Liability. (2) N

Manufacturer's liability. Statutes, regulations and common law rules; role of expert witnesses; insurance and product safety programs.

443 Value Analysis. (2) N

Critical investigation of functions, cost and design-manufacturing interlace in component development. Case histories.

INTERIOR ARCHITECTURE

INT 431 Programming for Public Health and Safety. (3) N

Analysis of public health and safety requirements for the built environment: water quality, sanitation, climate control, fire safety, building structure, human factors, exceptional users, personal security, and crime prevention. Consideration of code requirements, legal procedures and research findings.

465 Interior Architectural Acoustics. (3) S

Physical properties of sound. Reflection, absorption and diffraction of sound waves. Sound-absorption materials and constructions. Room acoustics and resonance; diffusion and decay of sound. Designing for optimum reverberation time. Acoustical defects and how to avoid them. Acoustical design. Noise transmission.

468 Interior Architectural Lighting. (3) F

Light as an aspect of interior architectural design. Developing brightness relationships in internal spaces;

appraisal of alternatives. Daylight and electric light as a single system. Evaluation of light sources for distribution, color and cost. Design methodology, experiments and case studies.

Professional Level Program Courses

The following courses are open only to students admitted to the professional level program, Bachelor of Science in Design, in the College of Architecture.

INDUSTRIAL DESIGN

IND 340 Color. (3) F

Theory and practice of basic color concepts, color systems, color relationships, psychology of color, color in industry.

342 Color Sketching. (3) F, S

Felt markers; quick representational and concept communication sketching. Forms in space, light and shade; material reflectance properties.

353 Mechanical Design I. (4) S

Linkages; cams; dimensions determination; stress concentration; fasteners; springs; screws.

354 Mechanical Design II. (4) F

Couplings; clutches; brakes; gears; bearings; lubrication. Prerequisite: IND 353.

360 Design Methodology and Techniques. (5) F

Acquaints the student with methods of visual thinking, conceptualization, and ideation while building skill levels in professional design presentation techniques.

361 Concept Development. (5) S

Emphasis on developing ideas into a complete functional product, including survey and application of esthetics, human factors, materials and manufacturing.

400 Professional Practice. (3) F

Business procedures, management techniques, accounting systems, ethical and legal responsibilities of the design professions. Prerequisite: senior standing. May be repeated for credit.

420 Graphic Design. (3) F

Visual design relating to products, packaging, display and signage. Mixed media.

421 Package Design. (3) S

Esthetic and marketing considerations of containing, protecting and promoting a product through packaging.

440 Plastics Design. (2) S

Mold design for part requirements; molded holes, threads; inserts; fastening and joining; decorating; extrusion design; reinforced plastics. Prerequisite: IND 340.

445 Structural Package Design. (2) S

Design; testing; cushioning; industrial standards, materials in packaging.

450 Design Project. (3) F

Large-scale interdisciplinary class project involving project planning and control, design, prototype development, feasibility study and reporting. Prerequisites: Senior standing and approval of instructor.

451 Design Project. (3) S

Design finalization; model; final technical and summary reports; graphics; oral presentation of results. Prerequisite: IND 450.

460 Unit Analysis and Design. (5) F

Complete analysis of the product unit as an element of

mass production emphasizing marketing, packaging, cost development, esthetics and detailing. Special attention to professional presentation.

461 System Synthesis and Design. (5) S

Product design with emphasis in systems interaction. Culmination of design process and technique. Individual project direction is encouraged.

463 Systems Design. (4) S

Integration of kinematics, human factors, materials and layout of components into total design concept. Prerequisite: IND 354.

484 Internship. (3) SS

Clinical internship, full-time summer internship under supervision of practitioners in the Phoenix area or other locales. Consent of industrial design coordinator is required.

INTERIOR ARCHITECTURE

INT 320 Interior Architectural Rendering. (3) F

Graphic representation methods used to describe and analyze space; emphasis on quick presentation techniques.

321 Interior Architectural Construction Documents. (3) S

Production of construction documents and specifications for interior spaces.

345 Interior/Exterior Plant Materials and Furnishings.

(3) S
Use of plant materials to enhance the quality of human spaces; use of exterior spaces as extension of interior spaces.

355 Interior Architectural Construction. (3) S

Application of finish materials and construction detailing for interior spaces. Prerequisite: ATE 353.

360 Human Habitation Space Design. (5) F

Studio problems in interior architecture related to behavioral response in personal and small group spaces for static and mobile situations.

361 Community Space Design. (5) S

Studio problems in interior architecture related to human privacy; emphasis on issues of public and private use of interior spaces. Prerequisite: INT 360

440 Interior Materials Performance Criteria I. (3) F

General analysis of interior architectural materials and performance criteria, codes and regulations.

441 Interior Materials Performance Criteria II. (3) S

Continuation of INT 440, with emphasis on furniture systems for commercial and institutional use. Prerequisite: INT 440.

442 Professional Practice I. (3) F

Business procedures, contractual forms, fee structures and professional liabilities of interior architectural practice.

443 Professional Practice II. (2) S

Continuation of INT 442. Prerequisite: INT 442.

455 Advanced Environmental Control Systems. (2) S

Methods of specifying and constructing systems which control the sensory input from the ambient environment. Prerequisite: ATE 352.

460 Commercial Space Design. (5) F

Studio problems in interior architecture related to commercial spaces such as restaurants, stores, business offices, banks, and hotels. Prerequisite: INT 361.

461 Institutional Space Design. (5) S

Studio problems in interior architecture related to institutional spaces such as schools, hospitals, and health care facilities. Prerequisite: INT 460.

484 Clinical Internship. (3) SS

Full-time summer internship under supervision of practitioners in the Phoenix area or other locales. Consent of coordinator of placement for interior architecture required.

Department of Planning

PROFESSIONAL LEVEL PROGRAM

Bernard M. Boyle, Chair

Purpose

The professional level programs in the Department of Planning are designed for full-time students over a two-year period. They concentrate and combine integrated lecture and laboratory course work involving both individual and team experiences. They are aimed at providing students with the necessary skills and facilities as they prepare for the practice of landscape architecture, city planning, or housing and urban development. The programs assume each student has previously acquired a liberal arts education. The program thrusts are toward acquiring competency in professional level skills in a rapidly changing and increasingly competitive technological society. One summer of clinical internship in a professional office under the direction of an approved preceptor and licensed practitioner is required (optional for the major in housing and urban development), and provides a distinct educational experience.

Organization

The Department of Planning's professional level programs are organized under the direction of the chair, and are administered by faculty coordinators in charge of the concentrations in Landscape Architecture and City Planning and the major in Housing and Urban Development.

Professional Level Curricula

Bachelor of Science in Design

Majors: Housing and Urban Development, Urban Planning.

A student seeking the Bachelor of Science in Design degree in the Department of Planning

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must complete satisfactorily a curriculum of 69 semester hours (66 semester hours for Housing and Urban Development), beyond the 65 semester hours of pre-professional requirements.

Housing and Urban Development (PUD), which is intended to provide familiarity with housing technology, planning and development, both in the private and public sectors.

Under the major in Urban Planning, the areas of course work concentration are:

City Planning (PUP), which exposes the students to the theories, methods and interdisciplinary concerns of the urban planning profession and the related area of urban design.

Landscape Architecture (PLA), which explores the reasons for and the techniques involved in the analysis, planning and design of the exterior environment, both natural and manmade. The program also provides various required and optional field trips. (Supplemental fees are assessed for these offerings.)

**Professional Level Studies—
Required Courses**

Housing and Urban Development

First Professional Level (Third Year)

Fall	<i>Semester Hours</i>
ACC 101 Elementary Accounting	3
ATE 353 Architectural Construction I	3
MGT 301 Principles of Management	3
PLA 301 Introduction to Landscape Architecture	3
PUP 301 Introduction to Urban Planning	3
REA 251 Real Estate Principles	<u>3</u>
	18

Spring

ACC 102 Elementary Accounting	3
ATE 451 Architectural Construction II	3
ECN 202 Principles of Economics	3
FIN 300 Fundamentals of Finance	3
MKT 300 Principles of Marketing	3
REA 331 Real Estate Finance	<u>3</u>
	18

Summer (Optional)

PUD 484 Clinical Internship	3
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Second Professional Level (Fourth Year)

Fall

ADS 305 Business Law	3
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CON 387 Building Construction Estimating	3
PUD 355 Housing Systems I	3
PUD 433 Building Codes and Ordinances	3
PUD 453 Construction Administration I	<u>3</u>
	15

Spring

DEA 472 Housing and Society II	3
PUD 356 Housing Systems II	3
PUD 454 Construction Administration II	3
PUP 403 Interdisciplinary Urban Planning	3
REA 441 Real Estate Land Development ..	<u>3</u>
	15

Total Credit Hours	
Pre-professional Studies	65
Professional Level Program	<u>66</u>
	131

Urban Planning

Concentration: City Planning

First Professional Level (Third Year)

Fall	<i>Semester Hours</i>
GLG 302 Man and Geologic Environment ...	3
GPH 371 Cartography	3
PLA 301 Introduction to Landscape Architecture	3
PUP 301 Introduction to Urban Planning	3
SOC 332 The Modern City	3
TRA 405 Urban Transportation	<u>3</u>
	18

Spring

ECN 401 Intermediate Price Analysis	3
ENG 301 Writing for Professions	3
GCU 361 Urban Geography	3
GPH 372 Air Photo Interpretation	3
HIS 420 American Urban History	3
REA 441 Real Estate Land Development	<u>3</u>
	18

Summer

PUP 484 Clinical Internship	3
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Second Professional Level (Fourth Year)

Fall

MAT 420 Introductory Applied Statistics	3
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POS 410	Urban Government and Politics	3
PUP 403	Interdisciplinary Urban Planning	3
PUP 412	Urban Planning Theory	3
Approved Elective*		<u>3</u>
		15
Spring		
DEA 472	Housing and Society II	3
PUP 401	Urban Design	3
PUP 414	History of the City	3
PUP 421	Quantitative Methods	3
Approved Elective*		<u>3</u>
		15
Total Credit Hours		
Pre-professional Studies		65
Professional Level Program		<u>69</u>
		134

*Approved electives may be selected from the following areas: GCU, GPH, POS, SOC, REA, TRA.

Urban Planning

Concentration: Landscape Architecture
First Professional Level (Third Year)

Fall		<i>Semester Hours</i>
AVC 410	Architectural Presentation Techniques	3
CEE 341	Surveying	3
PLA 301	Introduction to Landscape Architecture	3
PLA 361	Landscape Design I	6
PUP 301	Introduction to Urban Planning	<u>3</u>
		18

Spring

ENG 301	Writing for the Professions	3
GPH 372	Air Photo Interpretation	3
PLA 362	Landscape Design II	6
PLA 431	Landscape Construction and Materials	3
PLA 432	Plant Materials	<u>3</u>
		18

Summer

PLA 484	Clinical Internship	3
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Second Professional Level (Fourth Year)

Fall		
AAD 560	Professional Practice I	3
PLA 411	History of Landscape Architecture	3
PLA 461	Landscape Design III	6

PLA 463	Landscape Construction Documents I	<u>3</u>
		15

Spring

ERA 325	Soils	3
PLA 462	Landscape Design IV	6
PLA 464	Landscape Construction Documents II	3
	Approved Elective (ERA)	<u>3</u>
		15

Total Credit Hours

Pre-professional Studies	65
Professional Level Program	<u>69</u>
	134

Planning

PROFESSIONAL LEVEL PROGRAMS

PROFESSORS:

BOYLE (Arch 138), BURGESS, COOK, ELMORE, MUMMA

ASSOCIATE PROFESSOR:

LAI, SCALISE

ASSISTANT PROFESSORS:

FELLOWS, KIM, LARSON

DISTINGUISHED VISITING PROFESSOR:

SOLERI

PROFESSOR EMERITUS:

YELLOTT

General Studies Courses

These courses are open to any student of the University meeting the stated pre/corequisites and are recognized in other colleges' programs of General Studies.

LANDSCAPE ARCHITECTURE

PLA 301 Introduction to Landscape Architecture. (3) F
 The relevance of landscape architecture to the creation of humanized environments, with emphasis on natural factors.



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411 History of Landscape Architecture. (3) F
Physical record of man's attitude toward the land. Ancient through contemporary landscape planning and design.

URBAN PLANNING

PUP 300 The Planned Environment (3) F, S
Esthetic, social, economic, political and other factors influencing urban development in the 20th century.

301 Introduction to Urban Planning. (3) F, SS
Theoretical and practical aspects of city planning, emphasizing urban design. Interrelationships between physical planning, government and society. See CEE 371.

414 History of the City. (3) S
The city from its ancient origins to the present day, emphasizing the cities of Europe and America during the last five centuries.

Professional Program Courses

These courses are open only to students admitted to the professional level program, Bachelor of Science in Design, of the College of Architecture.

HOUSING AND URBAN DEVELOPMENT

PUD 355 Housing Systems I. (3) F
Historical development of preassembled, pre-coordinated, machine-produced building technologies; future trends in industrialized building technology. Field trips.

356 Housing Systems II. (3) S
Principles and uses of performance specifications; prefabrication, transportation, coordination; cost-estimating and activity-scheduling techniques for industrialized housing systems. Field trips. Prerequisite: PUD 355.

357 Housing Design for Mass Marketing. (3) F
Fundamental concepts and problems of marketing housing design within present economic, legal and social environments; consumer analysis, functional analysis, housing institutions.

358 Tourist Facility Design and Maintenance. (3) S
Concepts of the developer's role in architectural design, engineering and maintenance problems in hotels and resorts, including food service facilities.

359 Tourist Resort Design. (3) F
Interrelationships of social, economic and physical aspects of total tourist resort design; emphasis on physical development of tourist centers and resort areas.

433 Building Codes and Ordinances. (3) F
Analysis of national, state and local building codes and ordinances relative to their impact in architectural programming design and construction documentation. See ANP 433.

441 Construction Administration I. (3) F
Responsibilities during the construction phases of architectural services; includes preparation of bidding documents, issuance of addenda, bid evaluation, negotiation of construction contracts. Field office organization, legal responsibilities, construction contract agreements; use of Critical Path Method (CPM).

442 Construction Administration II. (3) S
Continuance of PUD 441 with emphasis on field observation of construction, shop drawings, reports and materials testing. Meetings, records, field orders, schedules, arbitration of disputes, architect's responsibilities to client during construction, applications for payment and project close-out.

484 Clinical Internship. (3) SS
Full-time internship under the supervision of practitioners in the Phoenix area or other locales.

LANDSCAPE ARCHITECTURE

PLA 361 Landscape Design I. (6) F
Landscape design, graphic skills, and principles of order applied to utilization of natural forms and materials. Field trips.

362 Landscape Design II. (6) S
Continuation of PLA 361, principles of landscape design, analysis and planning of landscape projects. Field trips.

431 Landscape Construction and Materials. (3) S
Design, construction, materials and site engineering aspects of landscape architecture. Field trips.

432 Plant Materials. (3) S
Natural components of landscape design; characteristics, applications, selection and use. Field trips.

451 Field Studies. (1-6) F, S, SS
Organized field study in specified national and international locations. May be repeated for credit.

461 Landscape Design III. (6) F
Theory and methods of large-scale landscape design and planning. Field trips.

462 Landscape Design IV. (6) S
Continuation of PLA 461; design of landscape projects in arid regions. Field trips.

463 Landscape Construction Documents I. (3) F
Preparation of landscape construction drawings; legal status, organization, layout, site survey plans, sections, elevations, details, schedules and coordination.

464 Landscape Construction Documents II. (3) S
Continuation of PLA 463.

484 Clinical Internship. (3) SS
Full-time internship under the supervision of practitioners in the Phoenix area or other locales.

URBAN PLANNING

PUP 401 Urban Design. (3) F
Analysis of the visual and cultural aspects of urban design. Theories and techniques applied to selected study models.

403 Interdisciplinary Urban Planning. (3) F
Basic theories and methods of urban planning with introduction to substantive issues of concern to urban planners. Visiting lecturers.

421 Quantitative Methods. (3) F
Tools useful for urban planning research; emphasis on demographic analysis and survey methods, including sampling, questionnaire construction, research design and data analysis.

451 Field Studies. (1-6) F, S, SS
Organized field study in specified national and international locations. May be repeated for credit.

474 Urban Development Planning Applications. (3) S
Applied methods and processes in land development planning. Feasibility research, environmental design, engineering, housing, and transportation planning. Field trips.

SPECIAL STUDIES

484 Clinical Internship. (3) SS

Full-time internship under the supervision of practitioners in the Phoenix area or other locales.

Special Courses: PLA, PUD, PUP—294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. See pages 32-33. Also consult University Continuing Education brochures for special course offerings.

Department of Planning
GRADUATE PROFESSIONAL
PROGRAMS

Purpose

The purpose of the graduate program of the Department of Planning is to produce professionals who are equipped to deal with the problems of energy technology and planning and urban/regional planning. It leads to the degree of Master of Environmental Planning, under which various course work concentrations may be pursued within the above two areas.

In addition, programs of independent studies are available in the areas of architectural administration and management, environmental analysis and programming, and preservation planning.

Goals

The explicit goals of the graduate program are:

- a) To advance the student's ability to conduct research relevant to the energy technology and planning professions.
- b) To enable students to develop their capabilities to fill specific professional planning roles of individual interest.
- c) To render service to the university, profession, community, state and region by pursuing research and planning projects directly related to them.
- d) To expand the store of knowledge about urban/regional planning and human settlement in arid regions.

Organization

The Department of Planning is organized under the direction of the chair, and administered by academic coordinators responsible for the various course work concentrations. Course subject matter is organized as follows: energy, design, planning, and technology laboratories, energy technologies and planning, and urban/regional planning.

Master of Environmental Planning Degree Program

The Master of Environmental Planning degree curriculum consists of two segments—a basic program of 24 hours and an advanced program of 30 hours—for a total of 54 semester hours of credit for those students not admitted directly into the advanced program.

The basic program is required of all students in the energy planning and technology course work concentration who do not hold a previous professional degree in architecture or engineering; and in the urban/regional planning concentration who do not hold a previous degree in the planning area for which they are applying. The basic program is intended to equip students of various backgrounds with sufficient professional preparation to undertake the course work required in the advanced program. In this regard, faculty advisory committees are especially constituted to establish the length of the student's basic program and to approve the courses to be taken.

The advanced program consists of 30 hours of course work in the concentration selected, as determined by the faculty advisory committee when the student completes the basic program.

Course work in the advanced program is divided as follows:

	<i>Semester Hours</i>
Required Courses	18
Coordinate Electives	6
Research Project or Thesis	<u>6</u>
Total	30

It is intended that within each concentration there be individual choice by the student with approval of the departmental advisory committee as follows:

Selection of coordinate electives offered in the College of Architecture or in other colleges of the University.

Selection of specific subjects for research or thesis projects.

Admission

Admission to the graduate program in Planning requires completion of all admission requirements and procedures set forth by the Graduate College; and the following additional requirements of the Department of Planning: completion of a baccalaureate or first professional degree and, preferably, at least one additional year of professional em-

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ployment or other experience acceptable to the admissions committee; submission and approval of a proposed course of study in a concentration offered by the Department; and selection of the candidate by the admissions committee. At the time of admission, students are enrolled in either the basic or advanced program depending on the type and amount of their previous preparation.

Note: Undergraduate students at Arizona State University interested in applying for the urban/regional planning course work concentration are advised to enroll in the professional level program in urban planning. See the *College of Architecture Planning Studies Bulletin*.

Application. The following should be submitted to the Admissions Office, Graduate College, Arizona State University, Tempe, Arizona 85287:

- a) The application for admission to the Graduate College.
- b) Two transcripts from each institution that the applicant has attended previously (except ASU).

The following should be submitted to the Office of the Chair, Department of Planning, College of Architecture, Arizona State University:

- a) Statement of the applicant's qualifications, including previous degree(s), employment, and travel history.
- b) Examples of the applicant's work evidencing prior preparation for the proposed course work concentration.
- c) Statement of the applicant's educational objectives in sufficient detail to indicate that they are congruent with the aims and capabilities of the Department.
- d) Certificate of Graduate Record Examination score.
- e) At least three letters of reference from the applicant's undergraduate instructors or others able to comment knowledgeably on his/her ability to do graduate work. Such letters shall be sent directly from the referee to the Office of the Chair, Department of Planning.

The above listed documents should be submitted together in 8½" x 11" portfolio format, using a notebook similar to a Ful-Vu CB-10 presentation binder with plastic sleeves.

Note: Application documents remain the property of the Department; however, examples of the applicant's work may be returned provided the applicant encloses a self-addressed return mailer with sufficient prepaid postage or personally signs for return of the examples following the selection date. Examples not so returned will be discarded by the Department after retention for one year.

Planning

GRADUATE PROFESSIONAL PROGRAMS

Graduate Program Courses

These courses are open to students admitted to the professional and graduate programs of the College of Architecture (see page 145).

Other courses open to any student meeting the stated pre/co-requisites are listed under the General Studies offerings.

ENERGY DESIGN, PLANNING AND TECHNOLOGY LABORATORIES

EDE 661 Climatic and Solar Architectural Design. (3) F; Cook

Laboratory and field experience in architectural synthesis emphasizing climatic criteria and analysis. Comparative climatic cases including arid and semi-arid regions. Emphasis on appropriate technology and passive thermal systems.

662 Energy Efficient Design and Planning. (3) S; Cook
Laboratory and field experience in energy efficient design emphasizing solar energy and related renewable and natural means for heating and cooling of multi-level energy efficient building types in urban and institutional complexes.

ENERGY PLANNING AND TECHNOLOGIES

ETE 501 Introduction to Solar Energy. (3) S
Introduction to theoretical and practical aspects of use of solar radiation and nocturnal cooling for control of building environments.

511 Energy Environment Theory. (3) F
Historical, theoretical and practical influences of energy and other resource systems on the designed environment; architectural, landscape, urban and regional implications of resource strategies, especially emphasizing solar and other renewable resources.

521 Solar Energy Technology. (3) F
Utilization of solar radiation and nocturnal cooling for heating and cooling buildings in arid and other regions.

522 Desert Habitation Technology. (3) F
Analysis of habitation approaches in nontechnological and technological societies arising from the nature of desert areas; includes aridity, availability of solar radiation, and extremes of temperature fluctuation, both diurnal and annual.

541 Experimental Energy Efficient Systems. (3-6) F
Design calculations and testing of experimental or advanced building systems and structures for energy efficiency and solar energy applications.

542 Building Thermal System Simulation and Optimization. (3)

Mathematical models of building envelope and comfort conditioning systems will be developed to simulate building energy systems; optimization techniques are also presented. Prerequisite: ETE 541.

551 Passive Building Performance I. (3) F

Current handbook and hand-held calculator evaluation techniques will be emphasized to determine environmental influence on comfort in small passive heated and cooled buildings.

552 Passive Building Performance II. (3) S

Advanced computer-aided evaluation techniques will be emphasized to determine environmental influence on comfort in large passive heated and cooled buildings.

553 Energy Conservation in Buildings. (3) S

Impact of natural forces on the design of buildings, emphasizing pre-design decisions and post-construction practices leading to minimum energy consumption. Investigation of new energy sources.

562 Energy Efficient Systems Research. (3-6) S

Empirical analysis of building materials and systems for energy efficiency. Individual or team research.

URBAN/REGIONAL PLANNING

PUP 401 Urban Design. (3) F

Analysis of the visual and cultural aspects of urban design. Theories and techniques applied to selected study models.

403 Interdisciplinary Urban Planning. (3) F

Basic theories and methods of urban planning with introduction into substantive issues of concern to urban planners. Visiting lecturers.

414 History of the City. (3) S

The city from its ancient origins to the present day, emphasizing the cities of Europe and America during the last five centuries.

421 Quantitative Methods. (3) F

Tools useful for urban planning research; emphasis on demographic analysis and survey methods, including sampling, questionnaire construction, research design and data analysis.

474 Urban Development Planning Applications. (3) S

Applied methods and processes in land development planning. Feasibility research, environmental design, engineering, housing, and transportation planning. Field trips.

511 Planning, Society, and the Law. (3) F

Law as a determinant of urban planning and development both in history and in the context of present laws on police power, eminent domain, tax policy, and governmental programs.

546 Planning and Development Control Law. (3) S

Case studies of the law affecting land development and public planning. Police power and eminent domain, zoning, subdivision controls, official mapping, urban renewal, housing, design controls, historic preservation, and exclusionary practices.

572 Interdisciplinary Urban Planning Practicum I. (3) S

Comprehensive planning workshop dealing with actual problems in an Arizona community. Data gathering and analysis, formulation and recommendation of alternative plans, policies, and strategies. Inclusive of interrelated social, economic, physical, and governmental

considerations. Field trips. Interdisciplinary, open to upper-class and graduate students with approval of the instructor.

574 Interdisciplinary Urban Planning Practicum II. (3) N

Interdisciplinary workshop emphasizing large-scale, physical project planning in an urban, new community, regional context with development by either a public agency or private enterprise. Development feasibility, urban and landscape design, housing, transportation, engineering, ecology, and regional planning. Field trips. Open to upper-class graduate students with approval of the instructor.

671 Urban Statistical Analysis. (3) F

Quantitative analysis in the urban context, demographic analysis, data processing, planning application and urban systems.

672 Land Economics. (3) S

Economic determinants for urban and regional planning; analytical techniques, elementary market analysis and feasibility studies; economic incentives in urban planning.

Special Courses: EDE, ETE, PLA, PUP 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599, 600, 680, 683, 684, 690, 691, 692, 693. (See pages 32-33.)



College of Business Administration

Purpose

The primary objective 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 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 percent of work in general education and other nonbusiness courses and 45 percent in courses offered by the College of Business Administration, with the remaining 10 percent selected from either area by the student in consultation with his/her advisor.

The College is a member of the American Assembly of Collegiate Schools of Business (AACSB), 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 organization.

The College is host to a chapter of Beta Gamma Sigma, a national society that recognizes high academic achievement in AACSB accredited schools. Election to Beta Gamma Sigma is the highest scholastic honor a student in business administration can earn.

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 continuing education

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 non-credit basis are organized in cooperation with various business groups for the furtherance 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, Finance, Management, Marketing, Quantitative Systems.

The Center for Health Services Administration offers a master's degree program designed to prepare qualified individuals who seek careers as administrators of hospitals and other health care organizations.

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 27 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 below. Students may select one of the following 13 fields of specialization:

- Accounting
- Administrative Services
- Advertising
- Computer Information Systems
- Economics
- Finance
- General Business Administration
- Insurance
- Management
- Marketing
- Quantitative Business Analysis
- Real Estate
- Transportation

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 education. Upper division students should major in secondary education with a subject matter in business. 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 172.

Master's Degrees. The Master of Business Administration degree, the Master of Health Services Administration degree, the Master of Accountancy degree, and the Master of Science degree in Economics are awarded upon

successful completion of programs detailed in the *Graduate Catalog*.

Master of Business Administration Degree: A general program designed to meet the needs of students who seek broad, integrated graduate course work 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 technical sciences, 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 Health Services Administration Degree: A program designed to prepare qualified individuals for careers as administrators of hospitals and other health services organizations. This preparation is carried out by providing the students selected theories, tools and techniques—the understanding, analysis, and application of which are essential for effective health services administration.

Master of Accountancy: A specialized program emphasizing preparation for public accounting and college teaching, with sufficient flexibility to include courses in managerial, tax and governmental accounting, as well as in allied fields.

Master of Science Degree in Economics: A specialized program for students who desire to teach in community colleges, to prepare for research positions in business and government, or to take additional graduate work in economics. The master's program in economics requires graduate work in macroeconomic analysis, microeconomic analysis and quantitative methods.

Doctoral Degrees

Doctor of Business Administration Degree. The objectives of the Doctor of Business Administration (D.B.A.) program are to prepare individuals for faculty positions in university or collegiate schools of business, and to prepare individuals for positions in business or government where the required educational background is doctoral-level study. The D.B.A. degree program is designed to provide a broad study of the interrelated areas of business administration and a high degree of

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professional competence in three fields of specialization.

The degree is granted upon the completion of an approved program of graduate study, successful completion of comprehensive written and oral examinations, and submission of an acceptable original research project presented in a dissertation.

Doctor of Philosophy Degree in Economics.

The 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 research positions in public agencies and private business organizations and for teaching and research in institutions of higher learning. The degree is granted upon the completion of an approved program of graduate study, successful completion of comprehensive written and oral examinations, and submission of an acceptable original research project presented in a dissertation.

Curriculum

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	57
Business Administration Core Curriculum	33
Field of Specialization	24
Electives	<u>12</u>
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. Courses of a specialized, vocational, technical, or professional nature may not be taken for General Studies credit.

Only certain approved courses from the departmental offerings listed below may be taken to satisfy the requirements in each of these areas. These specific courses are enumerated in *Policy Statement 57* of the College of Business Administration. Students, in consultation with their advisors, must select all *General Studies courses from this list*. Any exceptions must be approved by the Office of

Academic Advisement of the College of Business Administration prior to enrollment in the course.

Specific courses from the following departmental offerings may be taken to obtain the designated *minimum* number of semester hours required in each of the following areas:

Humanities and Fine Arts	8 sem. hrs.
Architecture (APH and DES courses only), art (ARH courses only), dance (DAH courses only), English, foreign languages (foreign language literature classes only), humanities, music (MHL courses only), philosophy, religious studies, theatre (THE courses only).	
Behavioral and Social Sciences	15 sem. hrs.
Anthropology, cultural geography, economics (ECN 201 and 202 <i>required</i>), education, engineering, technology, health education, history, home economics, journalism and telecommunication, political science, psychology (PGS courses only), sociology.	
Science and Mathematics	8 sem. hrs.
Biology, microbiology, botany, chemistry, engineering, agriculture, geology, mathematics (MAT 141 or more advanced course <i>required</i>), physical geography, physics, psychology (PSY courses only), zoology.	
Other General Courses	
Additional general courses which provide breadth and cultural background must be taken to bring the student's total General Studies credits up to the 57 hour minimum. (See <i>Policy Statement 57</i>) All students must complete ENG 101 and 102 (First-Year English), and one of the following communication courses—COM 100, 300, 305, or 405—as part of the General Studies requirement.	
Total General Studies 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 Administration must complete the following courses:

ADS 101	Elements of Business Enterprise	3
ACC 211	Elementary Accounting	3
ACC 212	Elementary Accounting	3
QBA 221	Statistical Analysis	3
QBA 222	Quantitative Information Systems	3
ADS 233	Business Communication	3
ADS 305	Business Law	3
FIN 300	Fundamentals of Finance	3
MGT 301	Principles of Management	3
MKT 300	Principles of Marketing	3

MGT 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, administrative services, advertising, computer information systems, economics, finance, general business administration, insurance, management, marketing, quantitative business analysis, real estate, and transportation.

Accounting. This field of specialization includes the essential academic training for: (1) those wishing to prepare 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:

	<i>Semester Hours</i>
ACC 321 Intermediate Accounting	3
ACC 322 Intermediate Accounting	3
ACC 331 Cost Accounting	3
ACC 351 Income Tax Accounting	3
ACC 383 Advanced Accounting	3
ACC 481 Auditing Theory and Practice	3
CIS 302 Management Information Systems	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 MAT 210, Mathematical Analysis, or the equivalent, as part of the program.

Administrative Services. The course work in this major area is designed to prepare students for careers in one of the following: office management, small business, secretarial administration, paralegal, and business education.

The field in administrative services shall consist of a minimum of 24 semester hours. The following 15 hours must be included:

	<i>Semester Hours</i>
OFA 351 Administrative Office Management	3
OFA 432 Records Management	3
ADS 461 Theory of Administrative Communication	3
ADS 431 Business Report Writing	3
CIS 302 Management Information Systems	3

To complete the field of specialization, the student, in consultation with his advisor, shall select 9 additional hours of course work from business and economics related to the areas described below.

Office Management. This area of emphasis is intended to prepare students for careers in office management, records management, and administrative services.

Small Business. This area of emphasis is intended to prepare students for careers in small business.

Secretarial Administration. This area of emphasis is intended to prepare students for careers as administrative secretaries.

Paralegal. This area of emphasis is intended to prepare students for careers as aides to lawyers, trust officers, escrow officers, agents, and brokers in private, governmental and industrial practice.

Business Education. This area of emphasis is intended to prepare students who wish to teach business, office, or distributive education subjects in secondary schools. (Lower division students enroll in the College of Business Administration as pre-secondary business education majors. Upper division students enroll in the College of Education.)

A student in business education must complete the Business Administration core and ECN 201 and 202. A teaching minor consists of 24 semester hours of credit in business (OFA 201 is required). The remaining courses to complete the major or minor must be selected in consultation with a Business Education advisor.

The Department of Administrative Services participates in programs leading to the degrees of Master of Education, Doctor of Education,

and Doctor of Philosophy, Secondary Education. Consult the *Graduate Catalog* for requirements.

Special Programs

Bilingual Secretarial. (French, German, Russian, Spanish). This special program is offered jointly by the Department of Foreign Languages and the Department of Administrative Services. Students interested in this program should consult the Chair, Department of Foreign Languages.

Non-degree Secretarial. These programs are developed for students who do not plan to graduate. Students must be regularly enrolled and must meet University entrance requirements. See an advisor in the Administrative Services Department for further information.

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 18 hours must be included:

	<i>Semester Hours</i>
ADV 301 Advertising Principles	3
ADV 311 Advertising Creative Strategy I	3
ADV 312 Advertising Creative Strategy II ..	3
ADV 371 Advertising Media	3
ADV 453 Advertising Campaign Problems ..	3
ADV 461 Advertising Management	3

To complete the field of specialization, the student, in consultation with his advisor, shall select 6 hours or more from the following group:

	<i>Semester Hours</i>
MKT 302 Fundamentals of Marketing Management	3
MKT 304 Consumer Behavior	3
MKT 310 Principles of Selling	3
MKT 321 Principles of Retailing	3
MKT 325 Public Relations in Business	3
MKT 451 Marketing Intelligence	3

Computer Information Systems. This field involves the evaluation of internal and external organizational data in order to develop and maintain computerized systems that produce information for planning and control decisions. Special emphasis is placed on the analysis, configuration, programming, and data base aspects of the design and implementation of a computerized business information system. The course work given below prepares the student for a career in business computer information systems and also enables the student to continue in specialized areas such as systems analysis, business applications, programming, business database design, business simulation, and decision support systems.

The field of specialization in computer information systems shall consist of a minimum of 24 semester hours. The following 18 hours must be included:

	<i>Semester Hours</i>
CIS 201 Business Programming	3
CIS 302 Management Information Systems	3
CIS 320 Intermediate Business Programming	3
CIS 407 Systems Simulation	3
CIS 420 Business Database Concepts	3
CIS 440 Systems Analysis and Design	3

To complete the field of specialization, the student shall select 6 hours of upper division courses approved in advance by the student's advisor.

Note: All Computer Information Systems majors must complete MAT 210, Mathematical Analysis, or the equivalent, as part of the program.

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 6 hours must be included:

	<i>Semester Hours</i>
ECN 401 Intermediate Price Analysis	3
ECN 402 Economics of Income and Employment	3

To complete the field of specialization, the student, with the approval of his advisor, shall select 18 additional hours of course work from among the upper division courses offered by the Department of Economics and from selected courses offered by the College of Business Administration.

Finance. Courses in finance provide students with an introduction to financial institutions, instruments and markets, and with an opportunity for increased understanding of the management problems of acquiring, allocating and managing funds.

A field of specialization in finance shall consist of a minimum of 24 semester hours. The following 18 hours must be included:

	<i>Semester Hours</i>
FIN 331 Financial Institutions	3
FIN 361 Managerial Finance	3
FIN 421 Securities Investment	3
FIN 426 Investment Management	3
FIN 431 Financial Markets	3
FIN 461 Financial Management Cases	3

To complete the field of specialization, the student, in consultation with his advisor, shall select 6 additional hours of course work from among the upper division courses offered in the College of Business Administration.

Students majoring in finance are urged to include ACC 321 and 322 in their program of study.

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 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 courses is required. One course from each of four departments in the College of Business Administration must be included in the student's program, selected from the following:

Accounting

ACC 321 Intermediate Accounting
ACC 331 Cost Accounting
ACC 351 Income Tax Accounting

Administrative Services

ADS 306 Business Law
ADS 461 Theory of Administrative Communication
OFA 351 Administrative Office Management

Economics

ECN 301 Money and Banking
ECN 321 Labor Economics
ECN 341 Public Finance

Finance

FIN 421 Securities Investment
INS 251 Principles of Insurance
REA 251 Real Estate Principles

Management

MGT 311 Personnel Management
MGT 331 Production and Operations Management
MGT 434 Social Responsibilities of Management

Marketing

ADV 301 Advertising Principles
MKT 302 Fundamentals of Marketing Management
TRA 301 Principles of Transportation

Quantitative Systems

CIS 302 Management Information Systems
CIS 320 Intermediate Business Programming
QBA 322 Managerial Statistics

Students may elect additional courses from the above list, subject to the limitations stated below.

The remaining 12 hours necessary to complete the field may be selected from upper-division (or a limited number of lower-division) courses in the College of Business Administration, subject to the approval of an advisor. A maximum of 12 hours in one subject area may be included.

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Insurance. Academic preparation for professional work in insurance sales, adjustment, management and underwriting 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:

	<i>Semester Hours</i>
INS 251 Principles of Insurance	3
INS 321 Life and Health Insurance	3
INS 331 Property Insurance Principles and Coverage	3
INS 431 Insurance Law	3
INS 451 Social Insurance	3

To complete the field of specialization, the student, in consultation with his advisor, shall select 9 additional hours of course work from among the upper division courses offered in the College of Business Administration. REA 251, Real Estate Principles, may be included.

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/her major emphasis on 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 15 hours must be included:

	<i>Semester Hours</i>
MGT 311 Personnel Management	3
MGT 331 Production and Operations Management	3
MGT 352 Human Behavior in Organizations	3
MGT 434 Social Responsibility of Management	3
MGT 468 Management Systems	3

The remainder of the required courses shall be selected by the student in consultation with his/her advisor.

Those students planning careers in Personnel Management shall select at least 6 semester hours from:

	<i>Semester Hours</i>
MGT 413 Wage and Salary Management	3
MGT 422 Training and Development	3
MGT 423 Industrial Relations and Collective Bargaining	3

Three additional semester hours must be selected from among the courses listed above or from among other courses offered by the Department of Management or approved in advance by the Chair.

Those students planning careers in production and operations management shall select at least 6 semester hours from:

	<i>Semester Hours</i>
MGT 335 Methods Management	3
MGT 355 Purchasing	3
MGT 432 Materials Management	3

Three additional semester hours must be selected from among the courses listed above or from among other courses offered by the Department of Management or approved in advance by the Chair.

Students planning careers in general management must select 9 hours from among the following:

	<i>Semester Hours</i>
MGT 433 Managerial Decision Making	3
MGT 459 International Management	3

(either or both) and choose one course from the three specified under personnel and/or choose one course from the three specified under production. Any exceptions to the above options must be approved in advance by the Chair of the Department of Management.

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 12 hours must be included:

	<i>Semester Hours</i>
MKT 302 Fundamentals of Marketing Management	3
MKT 304 Consumer Behavior	3
MKT 451 Marketing Intelligence	3
MKT 460 Marketing Decision-Making	3

To complete the field of specialization, the student, in consultation with his/her advisor, shall select 12 hours from courses offered in marketing, advertising, and transportation or courses approved in advance by the Department of Marketing.

Quantitative Business Analysis. Quantitative business analysis is the process of evaluating both external and internal data to produce decision guidelines for managerial action. Model development and both statistical and mathematical analysis provide the foundations for data evaluation. This field of specialization prepares students for professional opportunities in applied statistics, management science, and operations research.

The field of specialization in quantitative business analysis shall consist of a minimum of 24 semester hours. The following 18 hours must be included:

	<i>Semester Hours</i>
QBA 322 Managerial Statistics	3
QBA 391 Operations Research	3
QBA 422 Advanced Business and Economic Statistics	3
QBA 450 Decision Analysis Applications	3
CIS 201 Business Programming	3
CIS 407 Systems Simulation	3

To complete the field of specialization, the student shall select 6 hours from the following:

	<i>Semester Hours</i>
QBA 405 Sampling Techniques in Business ..	3
QBA 410 Applied Business Forecasting	3
QBA 494 Special Topics in QBA	3

Note: All Quantitative Business Analysis majors must complete MAT 210, Mathematical Analysis, or MAT 270, Calculus with Analytical Geometry I, or the equivalent, as part of the program.

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:

	<i>Semester Hours</i>
REA 251 Real Estate Principles	3
REA 331 Real Estate Finance	3
REA 401 Real Estate Appraisal	3
REA 411 Real Estate Law	3

To complete the field of specialization, the student, in consultation with the advisor, shall select an additional 12 hours of upper division business administration and/or economics courses (INS 251, Principles of Insurance, may be included). These courses must have the prior approval of the student's advisor.

Transportation. The program in transportation covers all modes of transportation of passengers and freight, and the special problems associated with each mode in urban, national and international transportation. Emphasis is on management of transportation organizations, government transportation policy and regulation of carriers, and the efficient use of transportation services by business management within the framework of the physical distribution management approach. Students are prepared for employment by carriers, businesses, and government agencies.

A field of specialization in transportation shall consist of a minimum of 24 semester hours. The following 15 hours must be included:

	<i>Semester Hours</i>
TRA 301 Principles of Transportation	3
TRA 445 Physical Distribution Management	3
TRA 460 Highway Transportation	3
TRA 461 Air Transportation	3
TRA 463 International Transportation	3

To complete the field of specialization, the student, in consultation with the advisor, shall select 9 or more hours from the following:

	<i>Semester Hours</i>
CIS 302 Management Information Systems	3
ECN 321 Labor Economics	3
ECN 336 International Economics	3
ECN 451 Economics of Public Utilities	3
ECN 453 Government and Business	3
MGT 355 Purchasing	3
MGT 432 Materials Management	3
MKT 331 International Business	3

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MKT	434	Industrial Marketing	3
MKT	435	International Marketing	3
MKT	444	Marketing Channels	3
TRA	405	Urban Transportation	3
TRA	462	Problems in Transportation	3

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 discretion 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 51 or consult the Office of the Dean of the College of Business Administration.

Pass-Fail. Students majoring in Business Administration may not include among the credits required for graduation any courses taken at this University on a pass-fail basis. Students with majors in the College of Liberal Arts may register for pass-fail credit 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/she is primarily interested. The student should follow the sequence of courses suggested in the four-year curriculum outline and the recommendations of the 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 2.25;
2. All Business Administration core curriculum courses numbered below 300 and ECN 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, including ECN 201 and 202.

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 they are replacing at Arizona State University.

Graduation Requirements. In addition to completion of the pattern of courses outlined on page 172, 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 higher;
 - (a) for all business courses taken at this University; and
 - (b) for all courses comprising his or her field of specialization taken at this University.

For computational purposes, the College of Business Administration averages D and E grades received in upper division business courses taken at Arizona State University into the student's grade point index in the College. A student may, by formal application to the Registrar, request that a grade of D or E in lower division courses not be included in his or her College index after the course has been

repeated in residence with a passing grade and prior to completion of the student's first baccalaureate degree.

3. Have earned a minimum of 51 semester hours in traditional courses designed primarily for junior or senior students and completed in an accredited, four-year degree-granting institution.

Any exception to the above requirements must be approved by the Standards Committee of the College of Business Administration.

Transfer Credit. Students planning to take their first two years of work at a community college or at another four-year college should take only those courses in business and economics that are offered as freshman or sophomore level courses at any of the three state-supported Arizona universities. These lower division courses are numbered 1 through 299 at the three Arizona universities. *A maximum of 30 hours of business and economics courses from community colleges will be accepted toward a bachelor's degree in business administration.*

Professional business courses taught in the junior or senior year in the three State universities may not be completed at a two-year college for transfer credit in the business core or major (field of specialization). The introductory course in business law will be accepted as an exception to this policy, but only lower-division credit will be granted. Such courses may be utilized in the free elective category *subject to the 30-hour limitation.* Courses taught as vocational or career classes at the community colleges which are not taught in the colleges of business at any one of the three State universities will not be accepted for credit toward a bachelor's degree. Courses taught in the upper division business core at the three State universities must be completed at the degree granting institution unless transferred from an accredited four-year school. Normally, upper-division transfer credits will be accepted only from AACSB-accredited schools.

The following general pattern of courses is recommended for students completing their first two years' work in a community college and who plan to transfer to Arizona State University without loss of credit:

Pre-professional Courses	27 Hours
Accounting	6
Economics	6

Statistics and Quantitative Information Systems	6
Lower Division Business Electives	9
General Studies	33-37 Hours
English	
Mathematics	
Science	
Humanities	
Social Sciences	

Suggested Four-Year Curriculum Outline

FIRST YEAR	<i>Semester Hours</i>
ADS 101	3
QBA 221	3
ENG 101, 102	6
MAT 141 (or other approved mathematics course)	2 or 4
Humanities, Fine Arts	3
Behavioral and Social Sciences	6
Science or additional Mathematics	5-7
Electives	3-5
SECOND YEAR	31-35
ACC 211, 212	6
ECN 201, 202	6
QBA 222	3
ADS 233	3
COM 100, 300, 305 or 405	3
Science and Mathematics	3
General Studies	8
THIRD YEAR	32
MKT 300	3
MGT 301	3
ADS 305	3
FIN 300	3
Behavioral and Social Sciences	6
Field of Specialization and Electives	14
FOURTH YEAR	32
MGT 463	3
Field of Specialization and Electives	28
	31

Certificate in International Business Studies.

The program of studies leading to the Certificate is designed to prepare students for positions with multinational firms, banks, government agencies and international organizations. This program is not a substitute for the listed areas of business specialization;

rather, the courses required for the Certificate add an international dimension to the student's chosen field of specialization.

The requirements for the Certificate are:

1. At least 15 semester hours of approved courses in international business. The objective of this requirement is to introduce the student to the environment and operating principles of international business, to the international aspects of the student's chosen area of specialization, and to the interaction of all the business disciplines in an international environment. ECN 336, International Economics, and MKT 331, International Business, are required of all candidates for the Certificate. Other international business courses are:

MKT	435	International Marketing
MGT	459	International Management
TRA	463	International Transportation
ECN	311	Economic Development
ECN	331	Comparative Economic Systems
ECN	361	Soviet and East European Economics
ECN	371	Latin American Economics
ECN	488	International Monetary Economics

2. At least 15 semester hours of approved electives in international and area studies. Six semester hours must be in courses which provide a cross-cultural perspective from the point of view of one or more disciplines. The remaining 9 semester hours must be in courses which provide an understanding of one region of the world.

3. Evidence of competence in a foreign language equivalent to one year of college study. Since careful planning and selection of courses are necessary to meet the requirements for the Certificate without exceeding the minimum number of hours required for graduation, interested students are urged to consult with a member of the International Business Committee as early as possible.

Asian Studies. Students in the College of Business Administration may pursue a program with emphasis in Asian Studies. As part of the Bachelor of Science degree requirements in Business Administration, at least 30 upper division semester hours of the program must be in Asian Studies content courses (listed on page 52). Reading knowledge of an Asian language is required. The Asian studies content program must be approved by the Center for Asian Studies. (See page 52). Fulfillment of the requirements is recognized on the transcript as a bachelor's degree with a

designation of the discipline—Asian Studies. It is possible to complete the certificate program in International Business Studies and the Asian Studies emphasis concurrently.

Latin American Studies. Students in the College of Business Administration may pursue a program with emphasis in Latin American Area Studies. At least 30 upper division semester hours of the program must be in Latin American content courses, including 15 semester hours of Latin American content courses in the College of Business Administration listed above under Certificate in International Business Studies (except ECN 361), and 15 semester hours of Latin American content courses in other disciplines (listed on page 56). A reading knowledge of either Spanish or Portuguese is required. A reading knowledge of both is recommended. The Latin American content program must be approved by the Center for Latin American Studies (see page 54). Fulfillment of the requirements is recognized on the transcript as a bachelor's degree with a designation of the discipline—Latin American Studies. It is possible to complete the certificate program in International Business Studies and the Latin American emphasis concurrently.

Mexican-American Business Administration Undergraduate Emphasis. The objective of this program is to provide educational opportunities for Mexican-Americans and other interested students who are preparing for leadership positions in local, regional, national and international firms.

The student may enroll in any field of specialization offered by the College of Business Administration. The candidate's degree in Business Administration, combined with directed linguistic and cultural studies, will provide the student with a unique educational experience and a broad background in the liberal arts and in business. Interested students should contact the Director of Student Advisement in the College of Business Administration.

Pre-Law Studies. Pre-law students may pursue a program of study in the College of Business Administration. 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 students should communicate with the dean of the law school they hope to attend and plan a 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 field of specialization 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 and who serve as advisors for students desiring a pre-law general business administration major.

Accounting

PROFESSORS:

(BA 223A). FRITZMEYER, HARIED,
HUIZINGH, IMDIEKE, R. E. SMITH, TIDWELL,
WILKINSON

ASSOCIATE PROFESSORS:

BOYD, FLAHERTY, JOHNSON, MCKENZIE,
RECKERS, RENEAU, ROWLEY, SANDERS,
WYNDELTS

ASSISTANT PROFESSORS:

ARRINGTON, DUNCAN, KNEER, O'DELL, PANY,
PATTISON, SCHWARTZ

ACC 211 Elementary Accounting. (3) F, S, SS
Theory and practice of accounting applicable to the accumulation, external reporting and external uses of financial accounting information.

212 Elementary Accounting. (3) F, S, SS
Selection and analysis of accounting information for internal use by management. Prerequisite: ACC 211.

300 Survey of Accounting. (3) N
Financial and managerial accounting emphasizing the uses of accounting information. Not open to students in the College of Business Administration.

301 Management Uses of Accounting. (3) N
The development, purpose and implications of cost accounting systems. Uses of accounting information for managerial decision-making, budgeting, and control. Restricted to nonaccounting majors. Prerequisite: ACC 212.

315 Financial Statement Analysis. (3) N
Analytical methods applied to financial statements for the guidance of management and investors. Designed primarily for nonaccounting majors. Prerequisite: ACC 212.

321 Intermediate Accounting. (3) F, S, SS
Accounting theory and practice applicable to determination of asset values and related problems of income determination. Prerequisite: ACC 212.

322 Intermediate Accounting. (3) F, S, SS
Accounting theory and practice applicable to liabilities and owner's equity. Special problem areas related to in-

come determination and financial reporting. Prerequisite: ACC 321.

331 Cost Accounting. (3) F, S, SS
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: ACC 212.

351 Income Tax Accounting. (3) F, S, SS
Federal income taxation of individuals, partnerships and corporations. Basic tax planning and research methods. Prerequisite: ACC 212.

383 Advanced Accounting. (3) F, S, SS
Accounting theory applicable to partnerships, branches, business combinations and governmental units. Prerequisite: ACC 322.

432 Advanced Cost Accounting. (3) S; McKenzie, Pattison
Decision-making, planning and control, including capital budgeting and applications of operations research and statistics. Prerequisite: ACC 331.

447 Accounting Information Systems. (3) F, S, SS; Kneer, Reneau, Wilkinson
Information systems requirements and data sources relative to the total integrated system of the firm, emphasizing system analysis and design, internal controls and computer processing. Prerequisites: ACC 331 and CIS 302.

452 Advanced Taxation. (3) F, S, SS; Boyd, Duncan, O'Dell
Problems of business and fiduciary income taxation; estate and gift transfer tax; tax research. Prerequisite: ACC 351.

475 Accounting in Public-Sector Organizations. (3) S; Huizingh
Principles of accounting and reporting, budgeting, and financial control systems applied in governmental units and other not-for-profit organizations. Prerequisite: ACC 301 or 331.

481 Auditing Theory and Practice. (3) F, S, SS; Fritzmeier, Haried, Kneer, Pany
Concepts, standards and methods in audit judgment formulation, internal control evaluation and program planning. Auditing procedures and sampling techniques. Ethical and legal responsibilities in auditing. Prerequisite: ACC 383.

495 Contemporary Accounting Theory. (3) F, S; Sanders, Schwartz
Theory of financial accounting and reporting requirements for profit oriented enterprises. Prerequisite: ACC 383.

500 Accounting Survey and Analysis. (3) F, S, SS; Stat.
Basic accounting concepts and procedures. Determination of periodic income. Preparation and interpretation of financial statements. Open only to students without previous credit in accounting.

501 Managerial Accounting. (3) F, S, SS; Arrington, Johnson, Rowley
Use of accounting data in the managerial decision-making process and in the analysis and control of business operations. Prerequisite: ACC 500 or equivalent.

511 Tax Planning for Management. (3) S, O'Dell, Wyndelts
Economic implications of selected management decisions involving application of federal income tax laws. Recognition of tax hazards and tax savings. Prerequisite: ACC 501.

182 ADMINISTRATIVE SERVICES

521 Tax Research. (3) F; Tidwell

Tax research source materials and techniques. Application to business and investment decisions. Prerequisite: ACC 351.

541 Managerial Accounting Controls. (3) F; Arrington, Johnson

Impact of internal reporting systems on organizational decisions and human behavior. Design, implementation, and evaluation problems. Prerequisite: ACC 331 or 501.

551 Advanced Accounting Theory. (3) F; Indieke

Generally accepted accounting theories and principles.

582 Auditing Theory and Practice. (3) S; Haried, Pany
Function and responsibility of the auditor in modern society. Advanced topics in auditing theory and methods. Contemporary issues in auditing. Prerequisite: ACC 481.

585 Analytical Methods in Accounting. (3) S; McKenzie, Pattison

Application of quantitative techniques to accounting problems. Prerequisites: ACC 501 and QBA 501 or equivalents

586 Problems in Financial Accounting. (3) S; Reckers, Smith

Problems in controversial areas. External reporting requirements for selected industries. Influence of government regulation.

587 Computerized Accounting Systems. (3) S; Kneer, Wilkinson

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. Prerequisite: ACC 447.

591 Seminar in Selected Accounting Topics. (3) F, S, SS; Boyd, Reneau, Wyndelits

791 Doctoral Seminar in Accounting. (3) F, S; Flaherty, Johnson

Special Courses: ACC 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799 (See pages 32-33.)



Administrative Services

PROFESSORS:

BOGGS (IRISH 3D), BATY, GRYDER, INMAN,
C. B. SMITH, TATE

ASSOCIATE PROFESSORS:

ARANDA, BOHLMAN, CHILDERS, DUNDAS,
HENNINGTON, HUTT, JACKS, JENNINGS,
LYNCH, OLNEY, RADER, A. B. SMITH, TOOTLE,
WILSON, WUNSCH

ASSISTANT PROFESSORS:

J. COCHRAN, DONOVAN, GILSDORF,
HURSTON, KELLER, LEONARD, LEWIS,
McGUIRE, MURRANKA, OBER, OLIVAS, REISS,
VAN HOOK

ADMINISTRATIVE SERVICES

ADS 101 Elements of Business Enterprise. (3) F, S, SS
Business enterprise as an integral part of American society. Emphasis on social, political, legal, and ethical considerations.

233 Business Communication. (3) F, S, SS
Theories of interpersonal processes and motivational systems as related to effective communication. Directed practice on recurring types of organizational communication.

305 Business Law. (3) F, S, SS
The legal environment of business. Judicial procedures, contracts, torts and agency law

306 Business Law. (3) F, S, SS
Legal aspects of corporations, partnerships, sales, negotiable instruments, property, secured transactions, bankruptcy, and insurance. Prerequisite: ADS 305.

307 Business and the Legal Environment. (3) F, S, SS
The American legal system. Contemporary legal problems of the modern business.

320 Entrepreneurship. (3) F, S
Opportunities, risks and problems associated with small business development and operation.

401 Small Business Administration. (3) F, S, SS; Aranda, Hutt, Olivas, Van Hook
Application of business principles by the small entrepreneur.

431 Business Report Writing. (3) F, S, SS; Baty, Inman
Organization and preparation of reports used in business. Prerequisite: ADS 233.

451 Business Research Methods. (3) F, S; A. B. Smith
Nature and purpose of research. Prerequisite: QBA 222.

461 Theory of Administrative Communication. (3) F, S, SS; Leonard
Intrapersonal, interpersonal and administrative communication.

500 Legal Environment of Business. (3) F, S, SS; Bohlmann, Olney, McGuire, Childers
Public and private aspects of the law and contemporary legal problems. Not open to those who have received credit in ADS 305 or equivalent.

501 Business Research Methods. (3) F, S, SS; Lynch, Ober, C. B. Smith, Wunsch
Selection, design, and completion of a business oriented research project.

591 Seminar: Professional Report Writing. (3) F, S; Tate

700 Research Methods. (3) S; Baty

Special Courses: ADS 484, 492, 493, 494, 497, 498, 499, 590, 591, 592, 593, 594, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 32-33).

BUSINESS EDUCATION

BUE 401 Vocational Education in American Schools. (3) N; Hutt

Basic principles and philosophies of vocational education.

480 Teaching Business, Office and Distributive Education Subjects. (4) F, S; Gryder

Organization and presentation of appropriate content for these subject areas in the secondary school.

491 Organization and Management of Cooperative Programs. (3) A; Hutt

Work-study programs for business occupations in high schools and community colleges.

501 Foundations of Business Education. (3) A; Boggs
History, philosophy, principles and objectives of business education.

503 Tests and Measurements in Business Education. (3) A; Keller

Construction, administration and evaluation of tests in business subjects.

505 Current Literature in Business Education. (3) A; Ober

Critical analyses, generalizations, and trends.

506 Data Processing for Teachers. (3) A; Keller

Electronic data processing equipment and computer programming.

511 Improving Instruction in Secretarial Subjects. (3) A; Murranka, Gryder

Modern methodology in teaching typewriting, shorthand and office education courses.

513 Improving Instruction in Accounting and Basic Business Subjects. (3) A; VanHook

Modern methodology in teaching accounting and basic business courses.

515 Observation and Work Experience. (3) A; Murranka
Observation and/or participation in business.

521 Education for Business in the Community College. (3) A; Murranka

Curriculum, instruction and articulation, with secondary schools and collegiate institutions.

591 Seminar. (3) A; Boggs, Gryder, Hutt, Murranka
Topics such as the following will be offered:

- (a) Guidance for Business Education
- (b) Analysis of Research in Business Education
- (c) Administration and Supervision in Business Education
- (d) Individualized Progression
- (e) Consumer Education

594 Study Conference or Workshop. (3) A; Boggs, Gryder, Hutt, Murranka

791 Doctoral Seminar in Business Education. (3) A; Boggs

Special Courses: BUE 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 32-33.)

OFFICE ADMINISTRATION

OFA 101 Basic Typewriting. (2) F, S, SS

Basic typewritten communications. Individual progression.

113 Shorthand. (3) F, S

Basic shorthand principles. Individual progression.

201 Advanced Typewriting. (3) F, S, SS

Advanced typewritten communications. Individual progression. Prerequisite: OFA 101.

214 Shorthand. (3) F, S

Intermediate shorthand dictation and transcription. Individual progression. Prerequisite: OFA 113.

312 Transcription. (3) F, S

Advanced shorthand dictation and transcription. Individual progression. Prerequisite: OFA 214.

331 Secretarial Administration. (3) F, S

Role of the professional secretary in facilitating managerial functions.

344 Administrative Services. (3) F, S

Services related to office systems. Prerequisite: OFA 201.

351 Administrative Office Management. (3) F, S

Relationship of the office function to the business enterprise.

432 Records Management. (3) F, S; Tate

Organization and management of records systems.

591 Seminar in Selected Office Administration Topics. (3) N; Boggs

Special Courses: OFA 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 594, 598, 599. (See pages 32-33.)

Economics

PROFESSORS:

(BA 319A), J. A. COCHRAN,
GOODING, GREENWOOD, M. JACKSON,
KAUFMAN, KNOX, LADMAN, McPETERS,
METCALF, PLANTZ

ASSOCIATE PROFESSORS:

BOYES, BRADA, BURGESS, COX, DeSERPA,
HOGAN, KINGSTON, LOWE, WINKELMAN

ASSISTANT PROFESSORS:

BLAKEMORE, DALTON, HAPPEL, HILL,
HOFFMAN, LOW, McDOWELL, MELVIN,
MENDEZ, SCHLAGENHAUF, SCHROETER

ECN 100 Development of the American Economic System. (3) F, S

Analytical treatment of the evolution of the American economy. Introduction to economic institutions in the United States.



201 Principles of Economics. (3) F, S, SS
Basic macroeconomic analysis. Economic institutions and factors determining income levels, price levels, and employment levels.

202 Principles of Economics. (3) F, S, SS
Basic microeconomic analysis. Theory of exchange and production, including the theory of the firm.

301 Money and Banking. (3) F, S, SS
Functions of money. Monetary systems, credit functions, banking practices and central banking policy. Prerequisite: ECN 201.

304 Contemporary Macroeconomic Issues. (3) F, S, SS
Macroeconomic principles applied to current problems of economic policy, e.g., inflation, unemployment, gross national product (GNP) forecasting. Prerequisite: ECN 201.

305 Contemporary Microeconomic Issues. (3) F, S, SS
Microeconomic principles applied to current problems of economic policy, e.g., pollution, crime, poverty. Prerequisite: ECN 202.

311 Economic Development. (3) F
Theories of economic growth and development. Role of capital formation, technological innovation, population and resource development in economic growth. Prerequisite: ECN 201 or 202.

321 Labor Economics. (3) F, S
Historical and theoretical analysis of labor problems and labor relations. Labor force wage theories and practices. Employment and unemployment. Government regulations. Prerequisite: ECN 202.

322 Economics of Human Resources. (3) F, S
Theory and measurement of human capital. Manpower policy for education, training and job matching, in the context of efficient market allocation. Prerequisite: ECN 202.

331 Comparative Economic Systems. (3) F
Economic theories and practices of capitalism, socialism, communism and fascism. Prerequisite: ECN 201.

336 International Economics. (3) F, S
The comparative-advantage doctrine, including practices under varying commercial policy approaches. The economic impact of international disequilibrium. Prerequisites: ECN 201 and 202.

341 Public Finance. (3) F, S
Public goods, externalities, voting models, public expenditures, taxation and budget formation with emphasis on the federal government. Prerequisite: ECN 202.

361 Soviet and East European Economics. (3) S
Economic development during the twentieth century. Analysis of contemporary institutions and problems. Prerequisite: ECN 201.

371 Latin American Economics. (3) S
Latin American economic development and current issues in the region. Prerequisite: ECN 201 or 202.

401 Intermediate Price Analysis. (3) F, S, SS; Boyes, Hill, DeSerpa
Role of the price system in organizing economic activity under varying degrees of competition. Prerequisites: ECN 201 and 202.

402 Economics of Income and Employment. (3) F, S, SS; Blakemore, Schlagenhauf
Determinants of aggregate levels of employment, output and income of an economy. Prerequisites: ECN 201 and 202.

408 Mathematical Economics. (3) F; DeSerpa, Schroeter
Integration of economic analysis and mathematical methods into a comprehensive body of knowledge within contemporary economic theory. Prerequisite: ECN 401.

421 Economics of State and Local Government. (3) S; Dalton
Financing state and local governments emphasizing budgeting, factors affecting expenditures, tax structures and fiscal capacity, and intergovernmental financial relations. Prerequisite: ECN 202.

441 History of Economic Thought. (3) F; Winkelman
Development of economic doctrines, theories of mercantilism, physiocracy, classicism, neoclassicism, Marxism and contemporary economics. Prerequisites: ECN 201 and 202.

451 Economics of Public Utilities. (3) S; Farris
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: ECN 201 or 202.

453 Government and Business. (3) F, S; Cox, McDowell
Development of public policies toward business. Antitrust activity. Economic effects of government policies. Prerequisite: ECN 202.

473 Urban Economics. (3) F, S; Staff
Models of urban growth and intra-urban location. The demand for and supply of urban public goods and services. Prerequisites: ECN 201 and 202.

488 International Monetary Economics. (3) F, S; Melvin
History, theory and policy of international monetary economics. Various international monetary systems and their effects on the domestic and international economic activity of participating countries. Prerequisite: ECN 201.

500 Fundamentals of Economic Analysis. (3) F, S, SS; Lowe
Microeconomic and macroeconomic 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.

501 Managerial Economics. (3) F, S, SS; Happel, Knox, Lowe, Plantz
Management problems from an economic point of view. Includes the application of economic analysis to decision-making in various areas of business policy development.

503 International Economic Theory. (3) A; Brada
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.

505 Monetary Policy. (3) A; Cochran
Determinants of the money supply and the level of interest rates. Federal Reserve policy and the effectiveness of central banking policy.

506 Monetary Theory. (3) A; Kaufman
Traditional and post-Keynesian monetary theory, interest rate determination, the demand and supply of money.

511 Macroeconomic Analysis I. (3) A; Blakemore, Boyes, Schlagenhauf
The nation's income, output, employment and general price level. Examination of current theoretical and empirical research and policy problems.

512 Microeconomic Analysis I. (3) A; DeSerpa, Hill, McDowell

Theory of exchange, production, resource use and pricing in capitalistic and mixed systems.

513 Macroeconomic Analysis II. (3) A; Boyes, Schlagenhaut

Advanced topics in macroeconomics. Emphasis on applied macroeconomic models. Prerequisite: ECN 511.

514 Microeconomic Analysis II. (3) A; DeSerpa, McDowell

Advanced topics in microeconomics. Emphasis on general equilibrium, welfare economics, and production and capital theory. Prerequisite: ECN 512.

521 Manpower Economics. (3) A; Blakemore, Burgess
Human capital theory and applications to factors such as education, training, earnings, discrimination and job search. Analysis of labor markets and manpower policy.

522 Human Resource Economics. (3) A; Kingston, Low
Analysis of labor supply and human resources. Manpower policy and program evaluation techniques. Prerequisite: ECN 521.

537 American Economic Growth. (3) A; Winkelman
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.

541 Development of Economic Analysis. (3) A; Winkelman

Historical development of economic theory. Emphasis on the development of economic analysis from pre-classical economics through Keynes.

553 Industrial Organization and Public Policy. (3) A; Knox, Cox, McDowell

Application of market theory to contemporary industrial organization, emphasizing oligopoly. Structure, conduct and performance in industrial markets. Recent developments in antitrust policies.

555 Public Sector Economics. (3) A; Dalton
Economics of collective action, public spending, and taxation. Impact of central governmental activity on resource allocation and income distribution.

570 Economics of Developing Nations. (3) A; Ladman, Mendez

Economic problems, issues and policy decisions facing the lesser developed nations of the world.

572 Regional Economics. (3) A; Staff

Introduction to export-base, input-output, linear programming, simulation, and econometric modeling as tools of regional analysis.

573 Urban Economics. (3) A; Staff

Models of urban growth and intra-urban location, the urban public sector, and cost-benefit analysis as a tool of urban analysis. Prerequisite: ECN 473.

580 Econometrics I. (3) F; Hoffman

Application of mathematical and statistical techniques to problems of economic theory. Problems in the formulation of econometric models. Prerequisite: 6 hours of statistics.

581 Econometrics II. (3) S; Hoffman

Advanced topics in econometrics. Emphasis on extending the simple linear model and on simultaneous relationships. Prerequisite: ECN 580.

591 Seminar in Selected Economics Topics. (3) A; Staff

791 Doctoral Seminar in Economics. (3) A; Staff

Special Courses: ECN 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 32-33.)

Finance

PROFESSORS:

POE (BA 267A), DAUTEN, STEVENSON, TENNEY

ASSOCIATE PROFESSORS:

CESTA, DAVIS, HENDERSON, MOREHART, MYLER, O'CONNELL, TRENNEPOHL, WILT

ASSISTANT PROFESSORS:

BOOTH, BUTLER, GALLINGER, IFFLANDER, KUDLA, MARTIN, OFFICER, PETERSON

FINANCE

FIN 203 Personal Finance. (3) F, S

Financial problems and institutions affecting individuals: borrowing, saving, insurance and investment. May be taken by students in the College of Business Administration for elective credit only.

300 Fundamentals of Finance. (3) F, S, SS

Theory and problems in financial management of firms. Prerequisites: ACC 102 and ECN 202.

331 Financial Institutions. (3) F, S, SS

Banking, savings, insurance, mortgage and other financial institutions. Analysis of their functions. Prerequisite: FIN 300.

361 Managerial Finance. (3) F, S

Capital budgeting, leverage, dividend and growth problems. Prerequisite: FIN 300.

421 Securities Investment. (3) F, S, SS; Cesta, Martin, Stevenson, Wilt

The environment and process of securities investment, and the appraisal of security value. Prerequisite: FIN 300.

426 Investment Management. (3) F, S; Cesta, Trennepohl

Principles of portfolio management. Investment selection and timing techniques. Prerequisite: FIN 421 or approval of instructor.

431 Financial Markets. (3) F, S; Booth

Asset, liability and capital management in financial institutions. Influence of market factors. Current problems and issues. Prerequisite: FIN 331.

461 Financial Management Cases. (3) F, S; Henderson, Ifflander, Kudla, Stevenson

Prerequisite: FIN 361.

500 Finance Fundamentals. (3) F, S; Henderson, Ifflander, Kudla, Stevenson, Trennepohl

Theory and problems in financial management of firms: working capital management, capital budgeting, and characteristics of securities issued by corporations. Prerequisites: ACC 500, QBA 500.

521 Security Analysis. (3) F; Martin, Wilt

Valuation techniques for bonds, common stock, preferred stock, warrants, and options; operation and regulation of security markets; introduction to portfolio management. Prerequisite: FIN 500.

526 Portfolio Management. (3) S; Cesta, Trennepohl
Capital market theory and security valuation in a portfolio context. Mathematical approaches to selection of optimal portfolios. Prerequisite: FIN 521.

531 Capital Markets and Institutions. (3) A; Booth
Recent theoretical and operational developments in economic sectors affecting capital markets and institutions. Prerequisite: FIN 500.

561 Financial Management. (3) F, S, SS; Gallinger, Henderson, Ifflander, Officer, Poe, Trennepohl
Case-oriented course in applications of finance theory to management issues. Acquisition, allocation and management of funds within the business enterprise. Working capital management, capital budgeting, capital structure, and financial strategy. Prerequisites: FIN 500, ACC 501.

581 Theory of Financial Decisions. (3) F, S; Gallinger, Henderson
Theories and applications of managerial finance and investments. Capital budgeting, capital structure, dividend theory, and valuation. Prerequisites: ECN 500, FIN 500 and QBA 501.

591 Seminar in Selected Finance Topics. (3) F; Staff

791 Doctoral Seminar in Finance. (3)

(a) Investments. F '82; Kudia
Investments and market theory; efficient markets hypothesis; option and commodity markets.

(b) Financial Institutions and Markets. F '81, S '83; Booth
Economic and monetary theory applied to financial markets and institutions; implications of financial structure for market performance and efficiency.

(c) Financial Management. S '82; Cesta, Trennepohl
Financial theory; capital structure, dividend policy, valuation, cost of capital, and capital budgeting.

Special Courses: FIN 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 32-33.)

INSURANCE

INS 251 Principles of Insurance. (3) F, S, SS
Coverages available, buying methods, procedures in settling claims, insurance companies and vocational opportunities.

321 Life and Health Insurance. (3) F, S
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: INS 251.

331 Property Insurance Principles and Coverage. (3) F, S
Policies and principles of fire and casualty insurance. For students planning careers in agency or home office work, or for a fundamental knowledge of insurance for business. Prerequisite: INS 251.

425 Current Problems in Insurance. (3) S; Morehart, O'Connell, Tenney
Major problems and issues in the insurance industry. Prerequisite: 9 hours of insurance.

431 Insurance Law. (3) F; Tenney
Legal concepts and doctrines applicable to the field of insurance. Prerequisite: 6 hours of insurance.

451 Social Insurance. (3) F, S; Morehart, O'Connell, Tenney
Insurance coverages provided by state and federal gov-

ernments: social security, unemployment insurance, workmen's compensation and other social or governmental insurance plans.

461 Estate Planning. (3) F, S; Staff
Use of life insurance with wills, trusts and business buy-sell agreements. Needs approach to estate planning.

591 Seminar in Selected Insurance Topics. (3) N; Staff
Special Courses: INS 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 32-33.)

REAL ESTATE

REA 251 Real Estate Principles. (3) F, S, SS
Regulation, practices, legal aspects and professional opportunities of the real estate business.

302 Real Estate Management. (3) F, S
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: REA 251.

331 Real Estate Finance. (3) F, S
Determining and developing financial requirements for real estate projects. Prerequisite: REA 251.

401 Real Estate Appraisal. (3) F, S; Davis
Factors affecting the value of real estate. Theory and practice of appraising and preparation of the appraisal report. Techniques in appraisals. Prerequisite: REA 251.

402 Income Property Appraisal. (3) F, S; Davis
Valuation of net income streams for various types of income producing properties. Prerequisite: REA 401.

411 Real Estate Law. (3) F, S, SS; Staff
Legal practices as they apply to the real estate field and to the fields of titles, mortgages, lending and trust work.

441 Real Estate Land Development. (3) F, S, Myler
Neighborhood and city growth. Municipal planning and zoning. Development of residential, commercial, industrial, and special purpose properties. Prerequisite: REA 251.

456 Real Estate Investments. (3) F, S; Butler
Analysis of investment decisions considering investing property types, market activities, and cash flows. Prerequisite: REA 251

461 Current Real Estate Problems. (3) S; Myler, Peterson
Recent developments in the fields of real estate, finance, taxation, zoning, planning, governmental regulations and government assistance programs. Prerequisite: REA 251.

591 Seminar in Selected Real Estate Topics. (3) N; Staff
Special Courses: REA 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 32-33.)

Health Services Administration

PROFESSOR:

EVELAND (BA 352B), BOISSONEAU

ASSOCIATE PROFESSOR:

WILLIAMS

ASSISTANT PROFESSOR:

KIRKMAN-LIFF

HSA 501 Health Care Organization. (3) F, S; Eveland
Structure, organization and function of contemporary health care delivery systems, with emphasis on health service components, their evolution, changing characteristics, interrelationships, and implications for the future.

504 Community Health Care Perspectives. (3) S; Boissoneau

Nature, language and concepts of the medical process, including a critical examination of community health services within a health planning framework.

520 Hospital Structure and Policy. (3) S; Boissoneau
Health care institutions with focus on hospital managerial structure and policy. Functional relationships among the administration, governing bodies, medical staffs and related elements. Prerequisite: HSA 501.

522 Hospital Administrative Organization and Practices. (3) F; Williams

Internal hospital organization and functions: analysis of managerial and clinical services, their relationships, problems and practices. Prerequisite: HSA 501.

532 Financial Management of Health Services. (3) F, S; Williams

Acquisition, allocation and management of financial resources within the health care enterprise. Budget administration, cost analysis, financing strategies, and internal controls. Prerequisites: HSA 520 and 522.

542 Health Care Jurisprudence. (3) F, S; Dundas

Legal aspects of health care delivery and their implications for hospital and health services administration. Considerations of legal sensitivity, responsibility, and vulnerability for the hospital administrator.

591 Integrative Seminar—Contemporary Issues. (3) F, S; Boissoneau

Current policies, problems and controversies across the broad spectrum of health services administration. Legislative developments, social and political impacts of public policy, educational programs, health manpower perspectives.

In addition, topics such as the following will be offered:

- (a) Comparative Health Care Systems
- (b) Health Information and Records Systems
- (c) Economics of Health Services Planning
- (d) Hospital Community Relations
- (e) Health Care Insurance Concepts

593 Applied Project. (3) F, S, SS; Eveland

Assignment to a hospital or other health care organization for an approved, supervised experience in the refinement of health-related managerial skills. Emphasis is on full range of exposure to management of both administrative and clinical elements.

Special Courses: HSA 590, 592, 598, 599. (See pages 32-33.)

Management

PROFESSORS:

FEARON (BA 367E), GROSSMAN, HEIER, INSKEEP, REIF, REUTER, RUCH, SCHABACKER, TINGEY, WERTHER, WHITE

ASSOCIATE PROFESSORS:

BASSFORD, BRENNSTUHL, D. COCHRAN, COOK, KREITNER, MENDLESON, RECK

ASSISTANT PROFESSORS:

ADAMS, BOHLANDER, BURTON, CALLARMAN, CLEMENT, KUR, MESCON, MONTANARI, MOORHEAD, PEARSON, SHIPPER, STEVENS, WOLFE

MGT 301 Principles of Management. (3) F, S, SS
Planning, organizing, and controlling human and other resources for the effective and efficient accomplishment of organizational objectives.

311 Personnel Management. (3) F, S, SS
Manpower planning, staffing, training and development, compensation, appraisal and labor relations. Prerequisite: MGT 301.

331 Production and Operations Management. (3) F, S, SS

Use of resources in producing goods and services. Concepts of planning, scheduling and controlling productive activities and physical resources. Prerequisite: MGT 301.

335 Methods Management. (3) F, S

Theory and practice in work design, methods improvement and work measurement. Relationship of attitudes and productivity. Prerequisite: MGT 301.

352 Human Behavior in Organizations. (3) F, S, SS

Human aspects of business as distinguished from economic and technical aspects and how they influence efficiency, morale and management practice. Prerequisite: MGT 301.

355 Purchasing. (3) F, S

Practices and problems confronting the purchasing manager, including sources of supply, market information, material specification and inspection, control records, inventories, stores and purchase budgets. Prerequisites: MKT 300 and MGT 301.

413 Wage and Salary Management. (3) F, S; Bohlander, Inskeep, Wolfe

Installation and administration of a complete wage and salary program. Includes objectives, policies, organization, control, job evaluation, wage surveys and methods of obtaining acceptance of an integrated program. Prerequisite: MGT 311.

422 Training and Development. (3) F, S; Burton, Clement, Kur

Learning theory, orientation and basic level training, management development, resource materials and methods. Prerequisite: MGT 311.

423 Industrial Relations and Collective Bargaining. (3) F, S; Bohlander, Werther

Processes and procedures of collective bargaining. Scope and negotiation of union contracts.

432 Materials Management. (3) F, S; Callarman, Fearon, Reck

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: MGT 331.

433 Managerial Decision-Making. (3) F, S, SS; Pearson, Ruch

Decision-making concepts, methods and approaches and their application to business problems. Managerial understanding and uses of quantitative decision-making tools. Participation in a management simulation. Prerequisite: MGT 301.

434 Social Responsibility of Management. (3) F, S, SS; Clement, Kreitner, Kur, Stevens

Relationship of business to the social system and its total environment. Criteria for appraising the social responsibility of management decisions. Role of managers as agents of organizational and social change. Prerequisite: MGT 301.

452 Organizational Behavior Applications. (3) F; Bassford, Mendleson

The complex set of behavioral forces and relationships that influence organizational effectiveness. Intervention strategies and application skills. Prerequisite: MGT 451.

459 International Management. (3) F, S; Brenenstuhl, Schabacker, Tingey

Management concepts and practices of multinational and foreign firms. Objectives, strategies, policies and organizational structures of enterprises operating in various social, economic, political and cultural environments. Prerequisite: MGT 301.

463 Business Policies. (3) F, S, SS

Policy formulation and administration of the total organization, including integrative analysis and strategic planning. Prerequisite: Completion of 90 hours, including all other Business Administration core requirements.

468 Management Systems. (3) F, S, SS; Ruch

Systems theory and management functions; basic tools for system analysis; organizational systems design; systems application in recent business practices; systems simulation. Prerequisite: MGT 301.

500 Fundamentals of Management. (3) F, S, SS; Adams,

Bassford, Brenenstuhl, Kreitner, Schabacker, White
Managerial functions. Performance models. Environmental constraints. Operations and personnel functions. Not open to students who have earned credit in MGT 301 or equivalent.

501 Managerial Concepts. (3) F, S, SS; Bassford, Fearon, Heier, Inskeep, Montanari, Schabacker, Reif

Analysis of current administrative philosophy and practices, and their historical foundations. Integration of an organization from the point of view of an administrator. Prerequisite: MGT 301.

503 Organizational Behavior. (3) F, S, SS; Bassford,

Cook, Kreitner, Mendleson, Montanari, White
Development of effective work groups in business. Analysis of cases in organizational relationships. Group dynamics, effects of change and informal organization.

520 Problems in Personnel Management. (3) S, SS;

Cook, Inskeep, Wolfe

Selecting, developing, maintaining and utilizing a competent labor force. Case studies of personnel problems. Preparation of a written personnel program.

522 Labor Relations and Public Policy. (3) F; Bohlander, Werther, White

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.

532 Materials and Purchasing Management. (3) S; Fearon, Reck

Analysis of the incoming flow of materials and the economic environment in which the materials acquisition and allocation functions operate.

581 Management of Production. (3) F, SS. Callarman, Reuter, Ruch

Analysis of the production function from a managerial point of view. Conceptual foundations, analysis of major problems and decision processes.

589 Business Strategy and Policy. (3) F, S, SS; Grossman, Mescon, Reif, Ruch, Schabacker, White

Formulation of strategy and policy in the organization, emphasizing the integration of decisions in the functional areas. Prerequisite: final semester of course work in the M.B.A. program.

591 Seminar. (3) F, S, SS, Staff

Topics such as the following will be offered:

- (a) Business Policy
- (b) Managerial Planning and Control
- (c) Business and Society
- (d) The Management Audit
- (e) Research and Development Management
- (f) International Management
- (g) History of Management Thought
- (h) Comparative Administration
- (i) Business Simulation

791 Doctoral Seminar in Management. (3) S; Fearon, Reif

Special Courses: MGT 484, 492, 493, 494, 497, 498, 499, 500, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799 (See pages 32-33.)



Marketing

PROFESSORS:

ROWE (BA 323E), BROWN, FARRIS, GWINNER, HARRIS, D. JACKSON, OSTROM, OVERMAN, SCHLACTER, WALKER

ASSOCIATE PROFESSORS:

BESSOM, CONEY, DANIEL, GOURLEY, PATTI, SHROCK

ASSISTANT PROFESSORS:

BELTRAMINI, BLASKO, CONLEY, EVANS, GAULDEN, GRIFFITH, McDONALD, MOKWA, STEPHENS, STUTTS, SWARTZ

ADVERTISING**ADV 301 Advertising Principles.** (3) F, S, SS

Advertising as a communications tool in marketing and business management. Creative methods, survey of media, measurements of effectiveness, and coordination with other aspects of the sales and promotional program. Not open to students with credit in MKT 412. Prerequisite: MKT 300 or MCO 110.

311 Advertising Creative Strategy I. (3) F, S

Application of communication theory to advertising. Identification of product and service attributes. Development and evaluation of advertising themes and messages. Prerequisite: ADV 301.

312 Advertising Creative Strategy II. (3) F, S

Development and expansion of advertising themes into finished print and broadcast messages. Evaluation of the creative aspects of advertising campaigns. Prerequisite: ADV 311.

371 Advertising Media. (3) F, S

Characteristics and use of broadcast and printed media. Relationship of media to markets. Audience measurement and analysis. Media scheduling. Prerequisite: ADV 301.

453 Advertising Campaign Problems. (3) S; Blasko, Patti, Stutts

Planning and executing the advertising campaign including research, budgeting, creative strategy, media planning, and campaign evaluation. Prerequisites: ADV 311 and 371.

461 Advertising Management. (3) F, S; Beltramini, Blasko, Patti

Administration of the complete advertising program. Marketing mix, budgeting, media strategy, measurement of effectiveness, coordination with other promotional activities. Use of the advertising agency. Prerequisites: ADV 301; MKT 300; and ADV 371 or MKT 451.

591 Seminar. (3) N; Patti

Special Courses: ADV 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 32-33.)

MARKETING**MKT 300 Principles of Marketing.** (3) F, S, SS

Role and process of marketing in the society and economy. Role and process of marketing in the organization. Prerequisite: ECN 202 or approval of instructor.

302 Fundamentals of Marketing Management. (3) F, S, SS

Marketing planning, implementation, and control by or-

ganizations, with special emphasis on identifying market opportunities and developing marketing programs. Prerequisite: MKT 300.

304 Consumer Behavior. (3) F, S, SS

Behavioral concepts in the analysis of consumer behavior in marketing strategy formulation. Prerequisite: MKT 300.

310 Principles of Selling. (3) F, S, SS

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.

321 Principles of Retailing. (3) F, S, SS

Role of retailing in marketing. Location, buying, promotion, organization, personnel and control in a retail enterprise. Prerequisite: MKT 300.

325 Public Relations in Business. (3) F, S, SS

Role of public relations in business, government and social institutions, emphasizing policy formulation.

331 International Business. (3) F, S

Multidisciplinary analysis of ideologies, cultures, politics, economics, social values and institutions as they relate to operations of the international firm. Prerequisite: ECN 202 or approval of instructor.

351 Marketing Intelligence. (3) F, S, SS; Staff

Integrated treatment of the traditional and decision-theory approaches to marketing research and analysis of environmental factors affecting marketing decisions in the firm. Prerequisite: QBA 221 or approval of instructor.

411 Sales Management. (3) F, S; Evans, Harris, Jackson
Application of management concepts to the administration of the sales operation. Prerequisite: MKT 300.

412 Marketing Communications. (3) F, S, SS; McDonald

The communication process as it relates to the promotional activities of the firm from a behavioral point of view. Prerequisites: MKT 302 and 304.

424 Retailing Management. (3) S; Evans, Walker

Problems of retailing management including functions within various institutions and retailing of commodities. Prerequisite: MKT 321.

434 Industrial Marketing. (3) S; Coney, Conley, Grossman, Harris

Strategies for marketing products and services to industrial, commercial and governmental markets. Changing industry and market structures. Prerequisite: MKT 300.

435 International Marketing. (3) F, S; Bessom

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: MKT 300.

444 Marketing Channels. (3) S; Conley, Evans, Walker

Distribution channels used by firms engaged in marketing and manufacturing. Strategies for marketing-channels management. Relationships among marketing intermediaries. Prerequisite: MKT 300.

460 Strategic Marketing. (3) F, S, SS; Gourley, Gwinner, Mokwa

Policy formulation and decision making by the marketing executive. Integration within and across marketing programs and consideration of current marketing issues and controversies. Prerequisite: MKT 302, 304, and 351.

500 Fundamentals of Marketing. (3) F, S, SS; Bessom, Brown

Marketing systems, concepts, institutions, and functions emphasizing the strategic adaptation of the firm to changing environmental conditions. Not open to students who have earned credit in MKT 300.

501 Marketing Management. (3) F, S, SS; Mokwa, Rowe, Schlacter, Walker

Marketing problems from the management point of view.

502 Public Relations. (3) N; Overman, Rowe

A system approach to managerial public relations emphasizing the relationship of the organization to its environment.

520 Marketing and the Behavioral Sciences. (3) S; Coney, Gaulden, Schlacter, Swartz

Concepts and theories from the behavioral sciences as they relate to marketing strategy formulation.

522 Marketing Information. (3) F; Gaulden, McDonald

Marketing research, marketing information systems and modern quantitative techniques in marketing decision-making. Prerequisite: MKT 501.

563 Marketing Strategy. (3) F; Mokwa, Ostrom

Concepts and techniques in developing the firm's total marketing strategy. Prerequisite: MKT 501.

591 Seminar. (3) N; Griffith, Gwinner, McDonald, Schlacter, Walker

Topics such as the following will be offered:

- (a) Product Strategy
- (b) Price Strategy
- (c) Channel Strategy
- (d) Promotion Strategy
- (e) International Business
- (f) Marketing in a Changing Environment
- (g) Marketing in Multinational Operations

791 Doctoral Seminar in Marketing. (3) S; Brown, Coney, Gaulden, Jackson

Special Courses: MKT 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 32-33.)

TRANSPORTATION

TRA 301 Principles of Transportation. (3) F, S, SS

Business practices of rail, motor, air, water and pipeline carriers and industrial shippers, including the influence of economic principles, government regulation and public policy

405 Urban Transportation. (3) F, S; Farris

Economic, social, political and business aspects of passenger transportation. Public policy and government aid to urban transportation development.

445 Physical Distribution Management. (3) F, S; Daniel, Griffith, Shrock

Management of the physical distribution function of the business enterprise. Prerequisite: TRA 301.

460 Highway Transportation. (3) F, S; Shrock

Highway systems of the U.S. Private and for-hire operations and management of freight and passenger motor carriage. Public policy and regulation by federal, state and local governments. Prerequisite: TRA 301.

461 Air Transportation. (3) F, S, SS; Cochran, Daniel

Economic and business aspects of commercial air transportation, rate-making, government control and assistance

to airline operations. Routes and services, equipment and operations, interrelationships with competing modes of transportation. Prerequisite: TRA 301.

462 Problems in Transportation. (3) S; Farris

Current problems of transportation policy, physical distribution and logistics, and carrier management. Prerequisite: TRA 301.

463 International Transportation. (3) F, S; Griffith, Daniel

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: TRA 301.

541 National Transportation Policy. (3) F; Farris

Public policy alternatives and problems in the transportation industry; interrelationships of competing transportation modes; relationships of public investment to private operation.

545 Business Logistics. (3) S; Daniel

Planning and control of the physical supply and distribution components of the firm's logistics system.

Special Courses: TRA 484, 492, 493, 494, 497, 498, 499, 590, 591, 592, 593, 598, 599, 700, 790, 792, 799. (See pages 32-33.)

Quantitative Systems

PROFESSORS:

PHILIPPAKIS (BA 297B), HERSHAUER, KAZMIER

ASSOCIATE PROFESSORS:

BURDICK, ECK, HUSTON, MILLER, POHL, WOOD

ASSISTANT PROFESSORS:

BROOKS, GREEN, HAKIM, HUGHES, KAKAR, KEIM, O'LEARY, VERDINI

COMPUTER INFORMATION SYSTEMS

CIS 201 Business Programming. (3) F, S, SS

Computer analysis of business data. Flowcharting, computer programming, and use of software for business applications.

302 Management Information Systems. (3) F, S, SS

Computer-based management information systems concepts and decision support systems. Cobol programming and review of other suitable languages.

320 Intermediate Business Programming. (3) F, S

Overview of business software concepts and recent developments. Business applications of the computer via high-level procedure-oriented languages. Prerequisite: CIS 302 or equivalent.

407 Systems Simulation. (3) F, S; Hakim, O'Leary

Development and analysis of systems models through computer simulation. Prerequisite: CIS 201 or equivalent.

192 QUANTITATIVE SYSTEMS

420 Business Database Concepts. (3) F, S; Miller, Philippakis

Overview, applications and management of business database systems and methods. Prerequisite: CIS 320 or equivalent.

430 Advanced Business Programming. (3) F, S; Miller, Philippakis

Advanced programming concepts in Cobol. Program structure and design. Software development cycle. Prerequisite: CIS 320 or equivalent.

440 Systems Analysis and Design. (3) F, S; Green, Keim, Wood

Principles and application of computer-based management information systems analysis and design. Prerequisite: CIS 302 or equivalent.

502 Computer Information Systems. (3) F, S; Huston, Keim, Wood

Electronic data processing systems for administrative applications. Computer hardware, software, and programming in business-oriented languages.

510 Systems Models and Simulation. (3) F, S; Hershauer, O'Leary

Design of computer-based decision systems. Simulation as a research and decision-making tool. Prerequisites: QBA 221 and Fortran or Basic programming.

591 Seminar. (3) F, S; Staff

Topics such as the following will be offered:

- (a) Management Information Systems
- (b) Decision Support Systems
- (c) Systems Design and Evaluation
- (d) Database Systems

Special Courses: CIS 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 32-33.)

QUANTITATIVE BUSINESS ANALYSIS

QBA 221 Statistical Analysis. (3) F, S, SS

Methods of statistical description. Application of probability theory and statistical inference in business. Prerequisite: MAT 141 or equivalent.

222 Quantitative Information Systems. (3) F, S, SS

Application of quantitative methods in business. Decision systems for production, marketing, finance and management. Use of standard computer programs. Prerequisite: QBA 221 or equivalent.

322 Managerial Statistics. (3) F, S

Applications of probability and statistical inference to business decisions. Decision theory and Bayesian inference. Prerequisite: QBA 222.

391 Operations Research. (3) F, S

Application of quantitative techniques in business organizations, such as the simplex method of linear programming, inventory models, games and strategies and simulation. Prerequisite: QBA 221.

405 Sampling Techniques in Business. (3) S; Burdick, Kakar, Hughes

Planning, execution and analysis of surveys typically conducted in business research. Simple random, stratified, cluster, systematic, and other sampling methods. Prerequisite: QBA 221 or equivalent.

410 Applied Business Forecasting. (3) F; Kakar, Wood

Application of recognized forecasting techniques in business and institutional environments. Prerequisite: QBA 221 or equivalent.

422 Advanced Business and Economic Statistics. (3) F, S; Burdick, Kakar

Application of multivariate analysis, including regression and correlation techniques, to business and economic

problems. Time series analysis. Prerequisite: QBA 322 or graduate standing.

450 Decision Analysis Applications. (3) S; Hakim, Hershauer, Verdini

Integration of quantitative techniques for the analysis and solution of managerial problems. Use of computer library programs for implementation of standard analytical techniques. Prerequisites: CIS 201, QBA 322 and 391.

500 Statistical Analysis. (3) F, S; Kazmier, O'Leary, Pohl

Basic statistical measures. Probability concepts. Statistical inference. Not open to students with previous background in statistics in business or other social sciences. Prerequisite: MAT 141 or equivalent.

501 Fundamentals of Quantitative Analysis. (3) F; Hakim, Hughes

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.

522 Quantitative Methods for Business. (3) F, S, SS; Brooks, Eck, Kazmier

Statistical and optimization concepts and methods for use in decision making. Prerequisite: QBA 500.

523 Quantitative Models in Decision-Making. (3) F, S; Eck, Verdini

Application of basic mathematical concepts to quantitative models, such as linear programming, nonlinear programming and stochastic processes. Prerequisite: MAT 142 or QBA 501.

524 Nonparametric Statistics. (3) S; Brooks, Kakar

Nonparametric statistical tests for location, dispersion, trend, association, correlation, and goodness-of-fit. Nonmetric scaling techniques. Prerequisite: QBA 500 or equivalent.

525 Experimental Design. (3) F, S; Burdick, Hughes

Analysis of variance and experimental design with emphasis on business research. Multiple regression and correlation. Nonparametric techniques. Prerequisites: QBA 500 and 501.

591 Seminar. (3) F, S; Staff

Topics such as the following will be offered:

- (a) Business Forecasting
- (b) Advanced Management Science Models
- (c) Decision Analysis
- (d) Advanced Statistical Research Methods

791 Doctoral Seminar in Quantitative Business Analysis. (3) N; Staff

Special Courses: QBA 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 32-33.)

College of Education

Robert T. Stout, Ph.D.

Dean

Purpose

The central purposes of the College of Education are to prepare leaders in education and to help improve the quality of education in the United States.

Supportive purposes 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 College of Education is comprised of eight departments. They are:

Counselor Education

Educational Administration and Supervision

Educational Psychology

Educational Technology and Library Science

Elementary Education

Higher and Adult Education

Secondary Education

Special Education

Several bureaus, centers and special laboratories directly complement the academic programs of the College. These include the Arizona Educational Information System; Center for Adolescent Research, Evaluation

and Service; Center for Bilingual/Bicultural Education; Center for Indian Education; Center for Multicultural Education; Counselor Training Center; Education Copy Service; Instructional Resources Laboratory; Office of Field Services; Office of Research Services; Office of Student Services; I.D. Payne Laboratory for Multicultural Education; Professional Field Experiences; Psychological Assessment Laboratory; Reading Center/Clinic; Southwest Regional Center for Community Education Development; Special Education Testing Clinic; and University Testing Services.

Degrees

Bachelor of Arts in Education Degree.

Several undergraduate programs are available leading to the degree Bachelor of Arts in Education which require a minimum of 126 semester hours of credit.

Master's Degree. Students may enroll in either the Master of Education or the Master of Arts degree program. Each program consists of 30-42 semester hours of study, depending upon given departmental requirements. The Master of Arts programs emphasize research competencies. The Master of Education programs stress development and extension of professional competence.

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 related disciplines, and for two professional specialization options. The Practitioner Option provides thorough professional preparation for counseling in a variety

of school and community settings. The Research Option is well suited as preparation for future doctoral study. With teacher certification, either option prepares the student for school counselor certification in Arizona and other states. For further information regarding admission and courses of study, contact the Department of Counselor Education.

Education Specialist Degree. The degree Education Specialist is awarded for satisfactory completion of the Specialist program of graduate studies.

Doctor of Education Degree. The degree Doctor of Education is awarded for satisfactory completion of the doctoral program of graduate studies.

Doctor of Philosophy Degree. The degree Doctor of Philosophy is awarded for satisfactory completion of this doctoral program of graduate studies.

Graduation and Certification Requirements

Admission to Undergraduate Programs

Elementary Education. Students wishing to become elementary school teachers should declare their intent during their freshman or sophomore year and register for advisement with the College of Education Office of Student Services. Advisors will assist students to meet all requirements for admission to and completion of the Professional Preparation Sequence.

Admission to the Professional Preparation Sequence requires:

1. Completion of at least 45 semester hours of appropriate University course work with a cumulative grade point average of 2.50 or higher;
2. Satisfactory completion of either EDF 200 or EED 366;
3. Formal approval by the Office of Student Services certifying that the student has met all requirements, including successful pas-

sage of such tests or examinations as may be indicated by State law.

Secondary Education. Students wishing to become secondary school teachers should enroll in the appropriate college for the first two years and should list the proposed teaching field as the major, followed in parentheses by the term "Pre-Secondary." Examples are shown in the box to indicate specifically how this is accomplished.

The college in which the student is enrolled will assign an advisor from the appropriate major department in cooperation with the College of Education.

Admission to the Professional Preparation Sequence requires:

1. Completion of at least 56 semester hours of appropriate University course work with a cumulative grade point average of 2.25 or higher;
2. Approval from the Office of Student Services certifying that all requirements have been met, including successful passage of such tests or examinations as may be indicated by State law.

Special Education. Freshman or sophomore students wishing to teach handicapped children or children with other exceptional characteristics should register for advisement in the College of Education Office of Student Services. An advisor from the Department of Special Education will be assigned.

Admission to the Professional Preparation Sequence requires:

1. Completion of at least 56 semester hours of appropriate University course work with a cumulative grade point average of 2.25 or higher;
2. Approval by the Department of Special Education certifying that all requirements have been met, including successful passage of such tests or examinations as may be indicated by State law.

<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 and Applied Sciences	Industrial Arts	Industrial Arts (Pre-Secondary)

Selected Studies in Education. Students who may wish to major in education but who may choose careers in fields other than public school teaching can elect to develop an individualized degree program. Such students should seek advice early from the College of Education Office of Student Services.

Admission of Transfer Students. Students planning to study education and who transfer to Arizona State University from other universities or colleges should seek advice early from the College of Education Office of Student Services.

Retention and Disqualification

1. A student must maintain a cumulative grade point average of 2.00 (C) or better to remain in good standing. Any student whose cumulative grade average is below the required index may be placed on academic probation. Once a student is on academic probation, he/she remains in that status until the grade point index reaches the retention level, 2.00, or he/she is disqualified from the University. Unless the Standards Committee acts otherwise, a student with a deficient grade point index is placed on probation for a minimum of one semester prior to being subject to disqualification.
2. A student must also maintain sound physical and mental health. A student who appears to lack the degree of physical and mental health necessary to function successfully as a teacher may be required to take a medical examination and make the results available to the Standards Committee of the College of Education. The responsibility for reviewing and determining the qualification of students whose behavior and/or performance are in question is vested in the Standards Committee. The Committee's decision may require the dismissal or disqualification of a student from the College.
3. Any student who has earned the number of semester hours required for graduation, but has not achieved the 2.00 index required for graduation, is subject to disqualification.
4. A disqualified student who desires to be reinstated may submit an application for reinstatement. A disqualified student normally will not be reinstated until at least one semester has elapsed from the date of disqualification. The burden of establishing fitness is on the disqualified student, who

may be required to take aptitude tests and submit to other examinations before being readmitted.

5. While students are subject to the general retention policy, they are evaluated in the College on broader criteria than mere academic average. Students are reviewed for evidence of competency for teaching and are continuously evaluated as they progress in the program. Prospective teacher candidates who do not meet the established criteria are counseled in an effort to guide them toward a program that is compatible with their interests and abilities.

Degree Requirements. Each candidate for graduation in a degree curriculum leading to Bachelor of Arts in Education degree is required to complete an approved program of at least 126 semester hours with a cumulative grade point index of 2.00 or above for: (1) All courses taken while a student at the University; (2) All courses included in his/her major teaching field; (3) And all professional education courses.

Standards for graduation also include (1) quality of scholarship, (2) personal and social fitness for the teaching profession, (3) mental and physical health, and (4) understanding of and the ability to work with students.

Specific requirements in addition to the above are available from the departments offering the particular program.

Each candidate must file a written application for graduation acceptable to the College of Education Standards Committee and receive a recommendation for graduation from the faculty of the College of Education.

General Studies. A minimum of 39 semester hours (54 semester hours in Elementary Education) of General Studies plus the University English requirement 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. A minimum of 8 semester hours (9 semes-

ter hours in Elementary Education) credit in the Humanities and Fine Arts (exclusive of freshman English);

2. A minimum of 8 semester hours (9 semester hours in Elementary Education) credit in the social and behavioral sciences, including a course in general psychology and a course in United States history;
3. A minimum of 8 semester hours (9 semester hours in Elementary Education) credit in sciences and mathematics, including one course in science and one course in mathematics.

The student should consult with his/her advisor for specific recommendations or 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.

4. Courses in Arizona and federal constitutions are requirements for certification.

Student Teaching

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.

Students planning to student teach should contact the Director of the Office of Professional Field Experiences for specific prerequisites. Application to student teaching must be submitted in the semester prior to the semester in which the candidate intends to student teach.

Requirements. Students admitted to student teaching must have a cumulative index of 2.25 or better and 90 semester hours of college credit. The cumulative index in the Teaching Major shall be at least 2.00 (some majors may require a higher index for entry into student teaching).

The completion date of the last education methods course must be within two years of the beginning date of student teaching to be accepted as meeting the prerequisites.

Students in the Elementary Education curriculum devote their full time to student teaching all day in the cooperating schools. 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. Secondary students

may devote all day to student teaching when their programs and major departments permit them to do so.

The student's course load is limited to 16 semester hours during the semester in which he/she is teaching. Student teachers are required to attend seminars conducted by the College Supervisor. Seminar time is arranged by each supervisor and is an integral part of the student teaching experience. 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.

Cooperating Schools Available. Excellent schools and school systems cooperate with the College of Education in the supervision of student teachers. Each of the schools presents its own particular type of organization and problems so that the student may receive experience in many types of work from the kindergarten through high school. Student teachers are required to adhere to the calendar, rules, regulations, and philosophy of the school in which they are accepted to student teach. Each student teacher is under direct guidance of a cooperating teacher, a college supervisor and the Director of Field Experiences. Students are strongly advised to seek student teaching assignments in multicultural and bilingual classrooms.

Student Teaching Waiver. Under certain limited conditions a student may be excused from student teaching. In general the conditions apply to persons who have extensive teaching experience. Specific conditions may be discussed with the Director, Office of Professional Field Experiences.

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.

Pass-Fail Grades. Students in the College of Education may participate in the Pass-Fail program of the College of Liberal Arts. 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 Department of Elementary Education prepares students to work in educational environments serving children through age 14. The programs are designed to assist candidates in providing the wisest possible nurture for all children. Successful candidates for the degree of Bachelor of Arts will be able to show proficiency in seven areas:

1. Personal and philosophical orientations;
2. Communication skills;
3. Knowledge of human development and human variability;
4. Use of measurement, assessment and evaluation techniques;
5. Mastery of appropriate subject matter;
6. Planning and organization of instructional activities;
7. Fostering positive student performance.

The Elementary or Early Childhood Education options lead to the degree of Bachelor of Arts in Education and to recommendation for certification for teaching in the kindergarten and grades 1-8. These degrees are intended also to help students prepare to work with children in other environments.

Major. The major in this field is Elementary Education. An option in Early Childhood Education is available.

Concentration. All Elementary Education majors must complete a program of concentration consisting of 27 semester hours within the degree. Courses in the concentration must be approved by the Department.

General Pattern. A minimum of 126 approved semester hours is required. This is divided as follows:

	<i>Semester Hours</i>
General Studies:	
Humanities and Fine Arts	9
Behavioral and Social Sciences	11
Sciences and Mathematics	9
General Studies Electives	19
Freshman English	<u>6</u>
Total General Studies	54
Elementary Professional Education or	
Early Childhood Education	45-48*
Educational Specialization	12*
Academic Minor	15*
Grand Total	<u>126</u>

*Hours will vary according to program.

Requirements for State Certification:

United States and Arizona Constitution ..	5
United States History	3
General Psychology	3

Within the general pattern of course work, students are strongly encouraged to include the following: 1) a foreign language, particularly Spanish or a Native American language; 2) work with children in classrooms or other settings; 3) experiences in multicultural and bilingual settings.

Advising. Advisors in Elementary and Early Childhood Education curriculums have check sheets with recommended and required courses for each year of work. These check sheets contain patterns of course work appropriately related to the age level of pupils with whom the student as a teacher will want to work. The check sheets also contain recommendations for General Studies electives and concentration. It is necessary for students to consult advisors in this curriculum in order to ensure the best possible program of education. This is particularly important inasmuch as the advisor must sign the checkout sheet for graduation which indicates that an approved program of course work has been developed.

Professional Education Alternatives

Campus Based. Students may take all their required courses in professional education on campus, with the exception of student teaching. Students in the campus-based program, however, are required to arrange to have substantial experiences with children prior to their student teaching.

Field Based. Students may take most of the courses required in professional education at field based sites established in the metropolitan area. During their junior year, students at the field based sites divide their time between interning in elementary school classrooms and taking college courses. Students devote one full semester during their senior year to student teaching at the same site where they earlier interned.

IF. IF is an experimental educational program for future elementary teachers. The program is based on the British tutorial system and is designed to put students in the center of the educational process. "IF" stands for "Integrated Field Tutorial" which refers to the philosophy of the program. Through field work, seminars and tutorials, students are

helped to integrate philosophy, theory and practice in ways consistent with their own personal orientations to life.

Secondary Education 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 recommendation for certification for teaching in the secondary school (grades 7 through 12).

Suggested Pattern. A program of 126 approved semester hours is required. This is divided as follows:

	<i>Semester Hours</i>
General Studies*	39
For details see page 36.	
Freshman English	3-6
Major Teaching Field (required)	36-42
Minor Teaching Field (optional)	24
Professional Education	25
Reading (RDG 467, 480)	3
United States and Arizona Constitution* .	3-5
United States History*	3
General Psychology*	3
Science* (1 course)	
Mathematics* (1 course)	

*United States and Arizona Constitution, U.S. history, general psychology, science, and mathematics, which are required for state certification, may be included in the General Studies requirement.

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 ensure the best possible program. This is necessary for the following reasons: (1) An advisor signs the graduation checkout sheet for that student. (2) Check sheets are revised each year on the basis of refinements which are incorporated into the program. (3) Check sheets offer excellent opportunity for the student to keep a record of his/her 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. The fields of music, art,

physical education, industrial education, and business, office and distributive education require special certification. In these fields 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. Courses approved by the advisor may be used to satisfy General Studies requirements as well as the requirements of a major teaching field. A composite social studies major consisting of 60 semester hours is available for those desiring broader preparation in social studies. It consists of at least 30 hours of one social science or history, plus 12 semester hours in each of two other related social sciences or psychology and 6 semester hours in another related field. In certain other 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 Student Services 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 completing a program in a minor teaching field, a program in Elementary Education leading to dual certification at both the elementary and secondary school levels, or a program leading to certification in Special Education. 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 consisting 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, the Office of Student Services, or the Department of Secondary Education.

Major and minor teaching fields under the secondary curriculum approved 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